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THE LIZARDS OF BRITISH SOMALILAND

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(Natural History)

With an appendix on *Topography and Climate*

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INTRODUCTION

The herpetology of British Somaliland offers a peculiarly interesting field for research, and a glance at the bibliography appended to the present paper indicates that it has already received a considerable amount of attention. The absence of roads and railways has hindered the complete exploration of the country so that, until recently, the collections obtained have been meagre and restricted to the more accessible districts. But the British Museum was singularly fortunate in the fact that Capt. Taylor, who served on the two boundary commissions which have surveyed the whole of the boundaries of the protectorate, took a keen interest in herpetology and has amassed what is undoubtedly the finest collection which has yet been obtained in the region. The author has already reported upon a small part of this collection (1932), but the larger amount of material now available, makes it possible to present a tentative account of the complete lizard fauna. The author has already drawn attention to the interesting zoo-geographical affinities of the herpetological fauna of Somaliland and its outlier in the Lake Rudolf basin (1932, 1936) and the conclusions reached have been fully confirmed by the additional material. But now, though the fauna can by no means be considered thoroughly known, it is possible to make a preliminary estimate of the distribution of the species within the territory; for a better understanding of this matter a knowledge of the topography and climate is essential, so that brief sketches of these subjects by Capt. Taylor are given as appendices herewith.

Even a cursory glance at the taxonomic section of the present paper will reveal two important facts; first, the very large number of species to be found in such a relatively small area and, secondly, the very high proportion of endemic species and races. Excluding from consideration the two introduced oriental geckos, *Hemidactylus flaviviridis* Rüppell and *H. frenatus* Dum. & Bib., no less than 72 species of lizards are found in an area comparable in size with Great Britain and one which is, on the whole, not remarkable for diversity of climatic and ecological conditions. Forty-five of these species (62 per cent) are endemics, some of which show definite indications of differentiation into geographical races within the country, and, of the non-endemic species, an appreciable proportion also shows differentiation in the Somaliland area. Such a very high degree of endemism on part of a continental land-mass is remarkable in the extreme and suggests specialisation or isolation. Probably both of these factors and others, have operated in the production of the present fauna. There is manifestly quite a high degree of geographical isolation, the triangular peninsula being bounded on two sides by the sea and on part of the third side by the Abyssinian mountains and Rift valley. This purely geographical isolation is reinforced by the climatic conditions. The rainfall of the north of the peninsula is for the most part less than 20 inches annually, but in the countries to the west and south the annual precipitation rises to an average of at least 20-30 inches except in the Lake Rudolf basin which, as has been pointed out, is an outlier of the Somali arid zone and bears a strong faunal resemblance to it. (fig. 1). The geographical isolation has, apparently, existed since the beginning, for the Abyssinian Plateau is regarded by Gregory (1921) as dating from the Jurassic whilst Somaliland itself is of later date. From a geological standpoint it is a relatively new land; Gregory believes that the main elevation of the land-mass which includes the peninsula, dates from the Cretaceous, but the presence of Miocene limestone (Dubar series) in the north of British Somaliland and large masses of Middle Eocene limestone in the Sol Haud and Eastern Haud (Macfadyen 1933) indicates that some of the country, at least, is of more recent origin. Separation from Southern Arabia appears to date from the Middle Pliocene (Macfadyen op. cit. p. 15).

The climatic history is not so well understood, but it is certain that there have been considerable changes since the land came into existence. A great deal of attention has been devoted to climatic changes during the Pleistocene in the countries surrounding Somaliland, but the absence of lakes renders this study difficult in the peninsula itself.

There is, however, no reason to suppose that a succession of climatic changes which extended from Palestine to Tanganyika Territory did not affect Somaliland also, and it is to be presumed that the succession

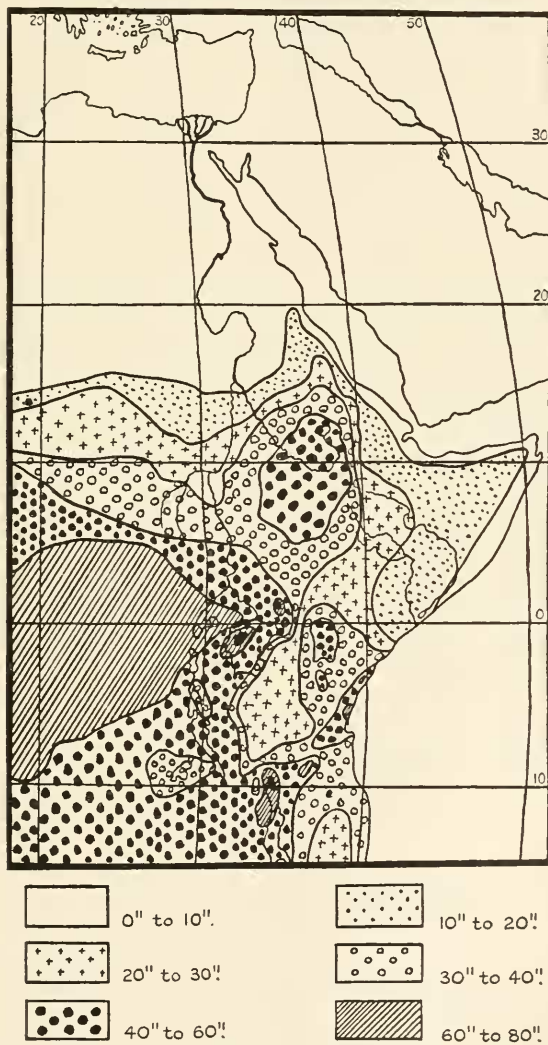


Fig. 1. Mean Annual Rainfall of N. E. Africa. (After Knox).

was the same there as elsewhere. Parkinson (1932) and Macfadyen (1932) have accumulated definite evidence that there were indeed wet periods in the area, whilst Fuchs (1939) has demonstrated a complex set of such changes in the Lake Rudolf basin (fig. 2).

Wayland (in Hale Carpenter, 1935, p. 437), basing his conclusions on the evidence obtained in Uganda and Kenya, believes that Abyssinia underwent two major pluvial periods during the Pleistocene, with a prolonged Interpluvial, and "two wet and two dry post-Pluvial (or epi-Pluvial) phases of lesser intensity". Fuchs finds evidence of 5 maximal lake-levels in Lake Rudolf and the suggestion of a very much less marked sixth (fig. 2). The first of these, which occurred at the end of the Lower Pleistocene, he correlates with Wayland's Pluvial I; the next three, placed as Chellean, Acheulian and Gamblian are correlated with Wayland's Pluvial II and the two most recent and least marked would accordingly correspond with the post-Pluvial Makalian and Nakuran wet phases. The evidence so far obtained in British Somaliland is not extensive, but the succession found by Macfadyen in the Bihendula-Dagah Shabell-Daban area is the most complete. The earliest fresh-water deposits are in the Daban Conglomerates and these are tentatively referred (Macfadyen 1933) to the late Eocene. This was followed by a phase of Posthumous faulting in the Gulf of Aden trend along the Dagah Shabell fault, which may, perhaps, be connected with the major movements which took place in Mid-Pliocene times and resulted in the separation of the peninsula from Arabia. There followed in succession (1) a period of boulder deposition, (2) a period of erosion "during what must have been a long-continued wet period", (3) the infilling of some of the valleys with the Younger Gravels and finally (4) a second period of erosion which Macfadyen believes may be the period existing to the present day. The significance of these various phases from a climatological point of view is uncertain; but it can safely be said that there must have been at least one and probably more wet periods of considerable duration during the Pleistocene.

Thus so far as British Somaliland is concerned, it appears from the geological evidence that, after the emergence of the land in the Middle Eocene, there was opportunity for faunal invasion both from the north and south; to the westward the Abyssinian plateau probably acted as a barrier to the free movement of many animals. This state of affairs continued until the middle of the Pliocene when the formation of the Aden Gulf inhibited or seriously restricted the possibilities of colonisation from the north, and a degree of geographical isolation was imposed

which has persisted until the present time. Subsequently, alternations of wet and dry climatic conditions must have profoundly affected the

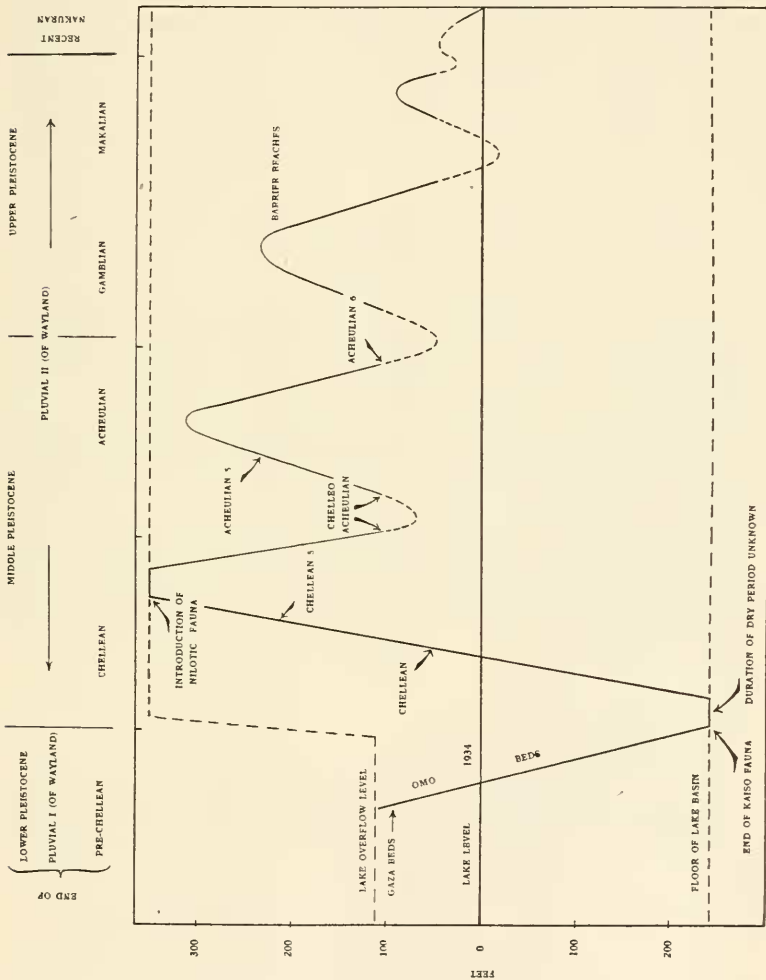


Fig. 2. Pleistocene Fluctuations in Lake Rudof. (After Fuchs).

flora and fauna. It seems highly improbable that any of the original migrants into the country would have persisted unchanged through

these environmental changes and it is reasonable to suppose that the present lizard-fauna, adapted to the semi-desert conditions now prevailing has to a considerable extent been evolved *in situ* since the last major wet phase. It might be argued that the bulk of the changes have taken place since the latest, Nakuran, wet phase which is estimated by Brooks (1922) at about 850 B.C. If this were so it would involve a rate of evolutionary change far in excess of that usually deemed probable, but it is a possibility which cannot be entirely neglected. Moreau (1933), however, calculates that during the Nakuran wet phase the average annual rainfall of the Lake Nakuru basin was probably not more than, at most, $5\frac{1}{2}$ inches greater than it is today and so can have been of little consequence. Even the Makalian period, dated between 10-20,000 B.C. by Brooks, is not believed to have had a rainfall "sufficiently greater than the present to permit of general forest growth" (Moreau *op. cit.* p. 431), but the Gamblian (ending about 20,000 B.C.; Brooks) seems to have been an "epoch of continuous forest" in Kenya. Of the present known lizard fauna in Somaliland not a single species can be regarded as a forest form, and if, as seems likely, conditions were similar in Kenya and Somaliland, it seems legitimate to conclude that the whole fauna has been completely changed since that time.

Analysis of the elements composing the fauna lends support to many of these views. The species, excluding from consideration the introduced species mentioned above (p. 4), can be divided into three groups as follows:

I. Northern species with an Eremian or Irano-Turanian distribution.

II. Ethiopian species.

III. Endemics.

These are listed in the accompanying tables and the approximate distribution of each species in Somaliland and elsewhere is given. The topographical divisions used by Capt. Taylor (Appendix I) are slightly modified for convenience in indicating distribution, and Ethiopia is divided into two parts, the highland plateau indicated by Ethiopia I and the Ogaden which is, of course, continuous with the Haud.

The following divisions are used in indicating distribution in British Somaliland. (1) *The Guban* ("a" of Capt. Taylor's topographical divisions); (2) *The Mountains of the Ogo*. Captain Taylor has pointed out that the northern mountain chain is interrupted eastward of the Golis ranges by the Huguf Plain and this interruption appears to coincide with the distributional limits of several species. Consequently

the mountains to the westward of this plain are included with the highland slopes of the Ogo (Taylor's "c") as a single unit. (3) *The Eastern Mountains*, comprising the highlands east of the Huguf Plain. (4) *The Sol Haud*, including the Daror Valley, (d & g). (5) *The Nogal Valley* (e) (6) *The Haud* (f). In addition, Italian Somaliland is considered under three divisions: (7) *Migiurtina* being the sultanate of that name in the extreme north; (8) *Obbia*, the central area; (9) *Shebeli & Juba*, being the southern zone comprising the provinces of Shebeli, Lower Shebeli, Upper and Lower Juba.

I. THE EREMIAN SPECIES

(Table I)

The presence of these species indicates that the present fauna is not wholly a development of the peninsula itself. They are obviously migrants from the north-west, from the true desert region where desiccation has progressed even further than in Somaliland. But from the fact that they form only about 13 per cent of the total lizard fauna it seems probable that the wet Abyssinian plateau does indeed form an effective barrier to faunal movement. It should also be noted (a) that many of them are limited to the extreme north-west, (b) that none have penetrated as far as the Lake Rudolf region and (c) that none of them show any tendency towards the formation of local races in Somaliland. This latter fact offers a very marked contrast with both the other faunal groups and the three above-mentioned facts together rather suggest the possibility that these Eremian species are recent migrants into the country and have had insufficient time to spread widely and become differentiated. But it must also be remembered that the northern coastal plain is also by far the hottest and driest part of the country (appendix p. 96) and so is essentially similar to the Saharan region; species adapted for life in the latter area will be particularly well adapted for the conditions prevailing in the Guban.

II. ETHIOPIAN SAVANNAH SPECIES

(Table II)

The second group contains 18 species (25 per cent) which have, for the most part, a "Sudanese" distribution (using the term in reference to Engler's botanical sub-province of the Savannah province) but also includes some ubiquitous species such as *Hemidactylus mabouia* de

Jonnés and *Agama agama* (Linn.). It will be noticed that (a) Many of these species with a wide range form distinct geographical subspecies and in four instances (*Platypholis fasciata*, *Latastia longicaudata*, *Rhampholeon kersteni* and *Riopa modesta*) one or more of these races is confined to the Somali peninsula. (b) In two instances the species has an "Eremian" subspecies (*Latastia longicaudata*, *Agama agama*) which enters Somaliland only in the dry, hot, northern zone, exactly like the species of group I (fig. 3); otherwise very few of these species are recorded from the Guban, and only two have been recorded from Southern Arabia.

III. ENDEMIC SPECIES

(Table III)

The 45 endemic species account for 62 per cent of the lizard fauna. It will be noticed that very few of them are uniformly distributed throughout the whole area and that a few appear to have, in the light of our present knowledge, a very limited distribution. Further exploration will no doubt prove that in many instances this is an illusion, but there are evidently faunal differences within the country, and a few ill-defined faunal provinces can be recognised. Best defined of all is the Guban, which, as has already been pointed out, has such marked Eremian affinities; of the 11 Somali forms found there, two are not known to occur elsewhere and at least two others (*Latastia boscai boscai* and *Philochortus spinalis*) are essentially north-western forms of Eritrea and Ethiopia. The mountains across the north of the country might be expected to form a distinctive faunal zone, and there are, indeed, a number of montane species which extend across the whole area and into the mountains of Ethiopia and Eritrea. But the Huguf plain, which breaks the mountain chain, appears to form a slight barrier, the mountains of the Ogo, to the westward of this dividing line having a richer fauna than those to the eastward. To the southward of the mountain chain, where the land slopes away gradually to the south-east, there are no obvious barriers and there is no abrupt faunal change. The species of the eastern mountains pass into the Sol Haud (and Migiurtina), whilst those of the west encroach upon the western and central Haud. But the Haud itself, together with the Nogal Valley, the Sol Haud and the Ogaden, forms what appears to be a distinctive faunal zone with a very rich fauna, of which 9 species are not found elsewhere. A number of the other species which do occur elsewhere show a tendency towards race-formation in this area though

TABLE I

	A. E. Sudan	Eritrea	Ethiopia I	S. Arabia	Guban	Mts. of Ogo	E. Mts.	Migiurtina	Sol Haud	Nogal Valley	Haud	Ogaden	Obbia	Shebeli & Juba	Lake Rudolf	Approximate distribution elsewhere
I																(Records badly confused with <i>H. turcicus</i>)
<i>Hemidactylus sinaitus</i>	✓	✓		✓	✓	✓			✓					✓		Borders of Mediterranean from Spain to N.W. India
<i>H. turcicus</i>	✓	✓		✓	✓	✓		✓								N.W. India to S.E. Arabia
<i>Pristurus rupestris</i>	✓	✓		✓	✓	✓										West Africa to Iran
<i>Ptyodactylus hasselquisti</i>	✓	✓		✓	✓	✓										Libya to Sinai
<i>Tarentola annularis</i>	✓	✓		✓	✓	✓										Rio de Oro to N.W. India
<i>Eremias guttulata olivieri</i>	✓	✓		✓	✓	✓		✓						✓		Egypt and Palestine
<i>E. mucronata</i>	✓	✓		✓	✓	✓										Nigeria to Syria
<i>Chamaeleon basiliscus</i>	✓	✓		✓	✓	✓										Morocco and Sierra Leone to N.W. India
<i>Chalcides ocellatus</i>	✓	✓		✓	✓	✓								✓		

TABLE II

	A. E. Sudan	Eritrea	Ethiopia I	S. Arabia	Guban	Mts. of Ogo	E. Mts.	Migiurtina	Sal Haud	Nogal Valley	Haud	Ogaden	Gbbia	Shebeli & Juba	Lake Rudolf	Approximate Distribution elsewhere
II																
Hemidaetylus mabouia			✓						✓			✓	✓	✓	✓	Cosmopolitan except Eremian region
Platypholis fasciata fasciata																Coastal belt of Kenya and Tang. Territory
P. fasciata erlangeri									✓						
Agama agama subsp.																Africa south of Sahara
Agama agama spinosa	✓	✓	✓		✓	✓										Egypt and Sinai
Agama cyanogaster		✓	✓		✓	✓								✓		Coastal plain and upland savannahs s. to Cape Province
Varanus ocellatus	✓	✓	✓		✓	✓					✓			✓		Littoral rocks, coastal plains and upland savannahs in Kenya and Tanganyika Territory
Eremias spekii spekii																Coastal plains and upland savannahs in Kenya and Tangan. Terr.
E. spekii sextaeniata			✓			✓				✓			?	✓	✓	Coastal plains and upland savannahs of Kenya
Latastia long. longicaudata	✓	✓			✓	✓				✓			✓	✓	✓	Senegal and N. Nigeria to Sinai
L. longicaudata revoulli	✓	✓			✓	✓				✓			✓	✓	✓	Upland savannahs of Kenya and Tang. Territory
L. long. doriai						✓										
L. long. caeruleopunctata											✓					
L. long. andersoni																
Gerrhosaurus major major				✓												Coastal plain and upland savannahs Kenya and N. Tang. Terr.

often it is not sufficiently marked for the race to receive taxonomic recognition.

There can thus be recognised four faunal divisions and the following is a summary of the composition of their lizard-faunae as far as at present known.

A. *The Guban* with 26 species and subspecies of which 2 are confined to this zone. Of the remainder, 12 are Eremian forms and 11 Somali endemics; 19 of the forms are also found in the Ogo, 11 penetrate to the Haud zone and 6 to the Eastern Mountains.

B. *The Western Mountains and Ogo* which, though no greater in area than the Guban, has 44 species and subspecies, 4 of which are not known to occur elsewhere; only 8 are Eremian forms, and 21 are Somali endemics; 19 of the forms penetrate into the Guban, 15 into the Eastern Mountains and 20 into the Haud.

C. *The Eastern Mountains*, the smallest and probably least collected area, has only 19 recorded species and races, of which none are confined to the area; three are Eremian forms, and 12 Somali endemics. Fifteen of the forms are common to the western Mountains, 6 to the Guban and 15 to the Haud.

D. *The Haud*, including the Sol Haud, Daror and Nogal Valleys and the Ogaden, is the largest area and has also the largest fauna. There are 52 recorded species and subspecies, 8 of which are not known to occur elsewhere; only 2 of the Eremian species penetrate into this zone and 36 of the forms are Somali endemics; 26 of the forms occur also in the Western Mountains and Ogo, 15 in the Eastern Mountains, but only 12 in the Guban. The fact that only 23 per cent of the lizards of the Haud are found in the Guban, 60 miles or less distant, indicate how very effective the mountain and climatic barriers are to the dispersal of animals of this group.

The almost complete absence of endemic genera in an area which otherwise shows such very pronounced endemism supports the geological evidence that this is a relatively new country; the endemism itself emphasises the effectiveness of the geographical and climatic barriers in imposing isolation. The distinctiveness of the fauna of the Guban points clearly to a very close linkage between the lizard fauna and the ecological conditions. The fact that 77 per cent of the species of the Haud, with a mean annual rainfall less than 20 inches, have been unable to colonise the dry Guban, and, conversely, that more than half of the forms found in the latter area have failed to penetrate into the Haud, makes it seem highly improbable that any of these animals could have tolerated the vastly different, wet condi-

tions of Gamblian times. As we have seen, migration into the area from both the north-west and the south has taken place, but the number



Fig. 3. Distribution of the Subspecies of *Latastia longicaudata*. Areas over 1500 metres stippled; over 2000 metres hatched.

° *Latastia longicaudata longicaudata* an Eremian subspecies ranging from Nigeria to Sinai.

● *L.l. revouli* ranging southwards into Tanganyika Territory; also reported from Eritrea.

+ *L.l. caeruleopunctata*

* *L.l. doriai*

† *L.l. andersoni*

of colonists which still exist in the countries to the north-west, where desiccation has progressed even further than in Somaliland, is small.

If, as seems probable, the process of desiccation has spread from the north, immigrants from the dry territories will also have spread south-

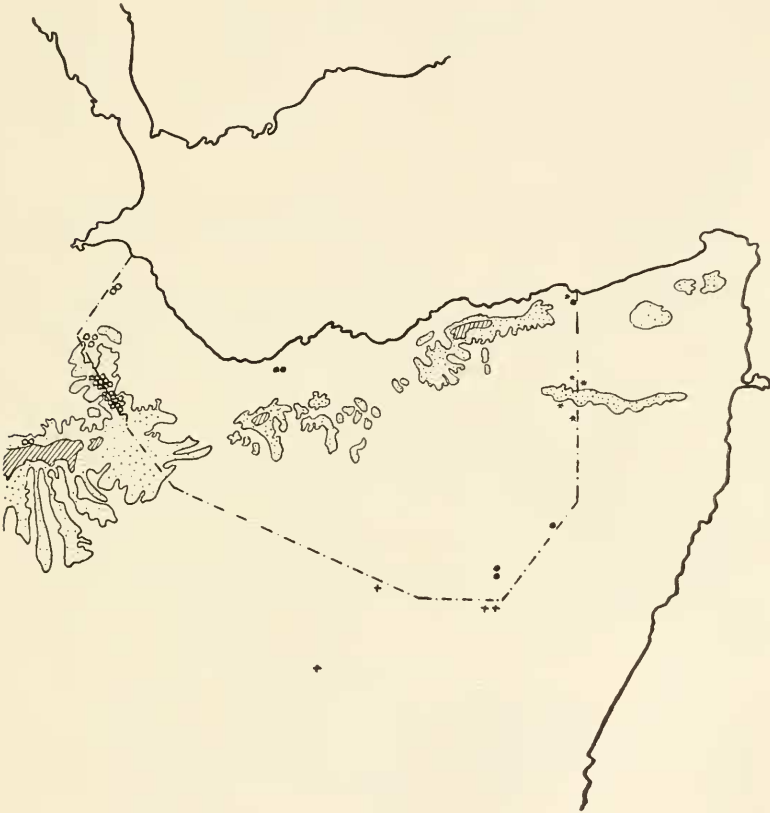


Fig. 4. Distribution of the Subspecies of *Latastia boscai* and *L. taylori*. Highlands as in Fig. 3.

◦ *L. boscai boscai*, a subspecies of the mountains of Ethiopia and Eritrea.

● *L. b. burii*

+ *L. b. arenicola*

* *L. taylori*

wards, to be replaced in the north by a succession of new immigrants better able to live under the progressively more arid conditions develop-

ing there. This would account for the large numbers of Lacertidae, a predominantly Palaearctic family, and for such forms as the Eublepharid geckoes (*Hemitheconyx*) and the genus *Teratolepis*, both of which have discontinuous Eremian distributions. But there is also a strong Ethiopian element in the fauna and, once again, the amount of sub-specific and specific differentiation which exists between the Somali forms and their relatives in the damper countries to the south emphasises the close connection between climatic conditions and faunal change.

In the following systematic section will be found synoptic keys to all the species which have been recorded from British Somaliland. Many of these are modified from tentative keys which Capt. Taylor utilised in the field, and so have been subjected to some testing. There are also notes on the taxonomy of some of the species and references to the original description, and to other names which have been used in reference to the same species in the Somaliland Peninsula. Notes on habits and habitats which have been incorporated are all based upon the excellent field notes provided by Capt. Taylor, and the specimens listed are those obtained by him during his journey along the southern and western boundaries. Occasionally, when revisionary work has embraced a wider field and led to a new and different opinion concerning the status of the forms involved, it has been found necessary to include keys to, and descriptions of, species which do not occur in north-east Africa. The bibliography given is probably far from complete, but it is hoped that it contains references to all the more important papers dealing with the lizards of British Somaliland.

Needless to say this paper could never have been written without the generous co-operation of a number of people, especially of Captain Taylor; acknowledgement of the author's gratitude to him is tendered herewith; also to Dr. Thomas Barbour for having it published by the Museum of Comparative Zoölogy, as well as to Mr. Arthur Loveridge and Dr. A. F. Carr, Jr. for seeing it through the press, Dr. Guiseppe Scortecci, Dr. W. A. Macfadyen, Dr. V. E. Fuchs and M. F. Angel, who have all rendered help by correspondence and the loan of valuable material, and to Col. M. Simon for the figure of a vertebra of *Brookesia superciliaris*.

GECKONIDAE

*Hemidactylus**

- I. Unregenerated tail depressed, root-shaped, marked off by a basal constriction, and usually shorter than the head and body.
- A. Back with rows of very large, trihedral, strongly-keeled tubercles; regenerated tail leaf-shaped.
1. 8-9 lamellae beneath the inner, and 10-12 beneath the fourth toe; 8 preanal, but no femoral pores *H. taylori* Parker
 2. 4-6 lamellae beneath the inner, and 6-7 beneath the fourth toe; a long series (28-36) of femoral and preanal pores
 *H. ruspolii* Boul.
- B. Back with rows of moderately large, smooth or slightly keeled tubercles; regenerated tail tapering.
- 4 lamellae beneath the inner, and 6-7 beneath the fourth toe; 12-18 femoral and preanal pores
 *H. laticaudatus* Andersson
- C. Back with uniform or nearly uniform dorsal scales.
1. Dorsal scales granular; 7-9 lamellae beneath the inner, and 12-13 beneath the fourth toe; 5-6 femoral pores on each side; no preanal pores *H. flaviviridis* Rüppel
 2. Dorsal scales sub-imbricate; 5 lamellae beneath the inner, and 8-9 beneath the fourth toe; no femoral pores; 4 preanal pores
 *H. curlei* sp. nov.
- II. Unregenerated tail conical, longer than the head and body, and without any basal constriction.
- A. Back with rows of strongly enlarged and usually more or less strongly keeled tubercles, often trihedral.
1. Free distal joints of the digits moderately long, the claw extending well beyond the basal dilatation.
 - a. Tail strongly depressed, the outermost row of tubercles forming a sharp ventro-lateral edge proximally
 *H. barodanus* Boul.
 - b. Tail but slightly depressed, without ventro-lateral crest.
 - i. A long series of femoro-preanal pores (20-40); 4-6 lamellae beneath the inner, and 7-8 under the fourth toe *H. brookii* Gray
 - ii. A series of preanal (2-12), but no femoral pores.

*Written prior to the trinomial treatment of certain of these species in Copeia, 1941, pp.245-248, which the author, being engaged in war work, has not had the opportunity of seeing.

- * Digits strongly dilated basally; 6-9 lamellae under the inner, and 9-12 under the fourth toe; preanal pores 6-12; adult size 54-80 mm.
 *H. macropholis* Boul.
 - ** Digits strongly dilated basally (fig. 6); 5-8 lamellae under the inner, and 8-11 under the fourth toe; preanal pores 6-8; adult size 40-59 mm.
 *H. turcicus* Linn.
 - *** Digits very feebly dilated basally (fig. 5); 5-8 lamellae under the inner, and 8-11 under the fourth toe; preanal pores 2-6; adult size 40-59 mm.
 *H. sinaitus* Boul.
2. Free distal joints of the digits short, the claw scarcely extending beyond the basal dilatation; 4-5 lamellae under the inner and 6-7 under the outer toe; preanal pores 4-7; adult size 26-36 mm. *H. citernii* Boul.
- B. Back with uniform granules, or with small conical or scarcely keeled tubercles.
1. Back and base of tail with definite enlarged scales or tubercles.
- a. Basal $\frac{1}{4}$ of toes granular like the sole of the foot; tubercles extending forward on to the occiput and neck; 5-7 lamellae under the outer, and 6-8 under the fourth toe; femoro-preanal pores 30-60. *H. mabouia* Mor. de Jonn.
 - b. Subdigital lamellae extending on to the sole of the foot.
 - i. Dorsal tubercles extending forwards on to the occiput and neck; 8-9 lamellae beneath the outer, and 9-11 under the fourth toe.
 - * Femoro-preanal pores 28-32; adult males up to 53 mm. from snout to vent; dorsal tubercles conical.
 *H. smithi* Boul.
 - ** Preanal pores 8; no femoral pores; adult males circa 70 mm.; dorsal tubercles flattened
 *H. jubensis* Boul.
 - ii. Dorsal tubercles not extending on to the head and neck; femoral pores 24-28. *H. frenatus* D. & B.
2. Back with uniformly small granular scales, or with a few very indistinct, slightly enlarged ones.

- a. Distance from the tip of the snout to the anterior border of the bony orbit a little longer than the distance between eye and ear; eye distinctly shorter than its distance from the nostril; claw extending well beyond the lamellar portion of the digits.
- i. Ventrals large, about 7 longitudinal series at mid-body corresponding to a distance equal to the diameter of the eye; subdigital lamellae abruptly differentiated from the granules of the sole. *H. laevis* Boul.
 - ii. Ventrals small, 12-16 longitudinal series at mid-body, corresponding to a distance equal to the diameter of the eye; subdigital lamellae very small proximally, scarcely larger than the granules on the sole, 5-6 beneath the inner, and 9-11 beneath the fourth toe; no femoral or preanal pores. *H. somalicus* Parker
- b. Distance from the tip of the snout to the anterior border of the bony orbit as long as the distance between eye and ear; eye as long as its distance from the nostril; claw only just extending beyond the basal lamellae, of which there are 5 under the inner, and 8-9 beneath the fourth toe; preanal pores 2. *H. megalops* Parker

1. HEMIDACTYLUS TAYLORI Parker

H. taylori Parker, 1932, Proc. Zool. Soc. London, p. 342.

This species has only been found in the Sol Haud, 9°10'N x 49°E and 9°35'N x 49°E; it is, apparently terrestrial, and probably nocturnal.

2. HEMIDACTYLUS RUSPOLII Boulenger

H. ruspolii Boulenger, 1896, Ann. Mus. Civ. Genova, (2), 4, p. 3, pl. i, fig. 1.

4 ♂ ♂, 4 ♀ ♀, juv.	Haud, 2100 ft. 46°20'E x 8°15'N
2 ♀ ♀	Haud, 3050 ft. 45°09'E x 8°37'N
♂	Haud, 3100 ft. 45°04'E x 8°39'N
4 ♂ ♂, 4 ♀ ♀	Ado, 2100 ft., Ogaden.

This very conspicuously marked black and yellow gecko appears to be confined to the eastern parts of the Haud in British Somaliland (east of the 45th meridian), but extends southwards through the Ogaden and Italian Somaliland to northern Kenya Colony and the Lake Rudolf basin. It is chiefly arboreal, being usually found beneath

the bark of dead trees, though Scortecci (1931, p. 127) records one as having been collected in the walls of an old building.

3. HEMIDACTYLUS LATICAUDATUS Andersson

H. laticaudatus Andersson, 1910, Jahrb. Nassau. Ver. Nat., 63, p. 200.

Known from a single specimen collected at Harrar, this gecko may perhaps be found in the mountains of the Ogo.

4. HEMIDACTYLUS FLAVIVIRIDIS Rüppel

H. flaviviridis Rüppel, 1835, N. Wirbelthiere Fauna Abess., p. 18, Pl. vi, fig. 2.

Though originally described from Massaua, this is in reality an oriental gecko, which appears to have been introduced along the Red Sea littoral in the neighbourhood of the ports.

5. HEMIDACTYLUS CURLEI spec. nov.

Holotype a ♀, number 1937.12.5.295 in the British Museum, from the Borama District (43°10'E. x 9°55'N), 5000 feet, collected among stones and rocks on Dec. 2nd, 1932.

Habitus very depressed; head broad and flat, its maximum width much greater than the distance between the tip of the snout and the posterior border of the eye. Nostril pierced between the rostral, first upper labial and 3 nasals, of which the upper is separated from its fellow by a single scale. Rostral much broader than deep, with a median cleft. Snout flat, covered with rounded juxtaposed granules, which are much larger than those on the very flat occiput; eight upper, and six or seven lower labials; mental triangular, nearly as long as broad; median chin-shields very large, forming a long median suture; a much smaller second pair of chin shields is followed by some enlarged scales bordering the lower labials. Ear opening small, oblique, its distance from the eye equal to the distance between nostril and eye. Body depressed, with a slight, median dorsal furrow, covered above with somewhat irregular, flat, subcircular, sub-imbricate scales and below with cycloid imbricate scales which are nearly twice as large as the dorsals; the latter are not absolutely uniform in size, but there is no trace of any definitely enlarged scales or tubercles; about 87 dorsals and ventrals in a series round the middle of the body. Tail strongly depressed, with a median furrow, root-shaped and with a distinct basal constriction; it is covered above with imbricating scales arranged in

transverse rows and is indefinitely annulate, 5 rows of dorsal scales forming an annulus; beneath there is a series of transversely enlarged subcaudals of which two occur on each annulus; the tip of the tail is regenerated, and this portion is not annulate, but covered above with quincuncially arranged imbricate scales and has transversely enlarged subcaudals. Limbs short, the adpressed hindlimb reaching the wrist. Digits well dilated basally and with moderately long terminal phalanges which extend well beyond the lamellar portion; lamellae extending on to the palms and soles, 5 under the inner, 8 under the fourth, and 7 or 8 beneath the fifth toe.

Yellowish above, heavily blotched and spotted with purplish black. A dark streak from the nostril through the eye and above the ear to the sides of the neck from whence it is continued as a row of spots to the base of the tail; flanks with an indefinite row of spots, and mid-dorsal area with series of rather irregular transverse blotches; tail with alternately darker and lighter cross-bars; limbs and flanks with scattered, circular, white spots. Lower surface white.

Length from snout to vent 43 mm.

Tail (posterior third regenerated) 42 mm.

Fore-limb 13 mm.

Hind-limb 14 mm.

Paratypes a male and 3 females from the type locality, collected 26.XI.32, a male collected between the type locality and Hargeisa (4100 ft., 44°E x 9°35'N) in October 1932, and a male and female from 43°E x 10°05'N, 16.IX.33.

These specimens were all collected amongst stones and rocks and agree in essentials with the holotype. The number of upper labials varies from 8 to 10, of lower labials from 6 to 8, of scales round the body from 81 to 93, and of subdigital lamellae beneath the fourth and fifth toes from 8 to 9 and 7 to 9 respectively. Males have 4 preanal pores. The colour is similar to that of the type, but the markings are usually quite irregular. No specimen has a completely unregenerated tail, but the fully regenerated appendage is similar in shape to the unregenerated, but without annuli and without transverse scale-rows.

The species resembles the Sokotran *H. homoeolepis* Boulenger in its flat, subimbricate scales, a character in which it approaches the genus *Teratolepis*. But it differs from both *homoeolepis* and its ally *laevis* in its much more depressed habitus and the root-shaped tail. No species with this type of caudal appendage has such uniform flat scales or so few subdigital lamellae; the species which it approaches most nearly is *H. zolii* Scortecci.

6. HEMIDACTYLUS BARODANUS Boulenger

H. barodanus Boulenger, 1901, Proc. Zool. Soc. London, p. 48, pl. vii, fig. 2.

4 ♂♂, 7 ♀♀ & 2 juveniles from the Borama district (9°55'-10° 20' N x 42°25'-43°15'E) at altitudes of from 4000-6000 feet.

Previously this gecko was known from but a single specimen collected at Gan Lebar (=Gaan Libah) in the mountains S.S.W. of Berbera; in addition to the foregoing series from the mountains of the Ogo it has now also been found in the mountains of western Ethiopia.

The Ogo series shows a range of variation in the size and strength of keel of the dorsal tubercles which is quite comparable with that noticed in *H. turcicus* (q.v.). In some individuals the tubercles are large and trihedral, as in *H. macropholis* but in others they are less than half this size and only feebly keeled. These latter agree with the unique type of *barodanus*. Hitherto the shape of the tail has not been definitely known, but owing to the fact that the basal portion of it, which is the only part existing in the type, is strongly depressed, the author (1932, p. 346) placed the species amongst those in which this organ is root-shaped and constricted basally. This is not the case, however, for the complete tail has no such constriction and is slightly longer than the head and body. It is strongly depressed, its depth being about half its breadth, and the outermost row of tubercles forms a sharp ventrolateral edge in the proximal part. This character distinguishes the species readily from both *turcicus* and *macropholis* which it resembles in the number of subdigital lamellae (6-8 under the inner, 9-11 under the fourth and 10-12 under the fifth toe), femoral pores (6-11) and tubercles; in both the tail is nearly circular in section and the outermost row of tubercles is not, or scarcely, ventral to the lateral midline.

The largest male and female each measures 70 mm. from snout to vent.

All the specimens were collected in, or under, stones and rocks.

7. HEMIDACTYLUS BROOKII Gray

H. brookii Gray, 1845, Cat. Lizards Brit. Mus., p. 153.

It seems peculiar that this common house gecko, wide-spread through the Sudanese and northern Savannah provinces of Africa and in the Indo-Malayan region should not have been discovered in British Somaliland. It has been reported from the Harrar region of Ethiopia (Jaldessa) and from Italian Somaliland (Lugh).

8. HEMIDACTYLUS MACROPHOLIS Boulenger

H. macropholis Boulenger, 1896, Ann. Mus. Genova, (2), 17, p. 3, pl. i, fig. 2.

9 ♂ ♂, 6 ♀ ♀, 5 juvs. Haud, 2100–4000 ft., between 44°15' — 46°20'E
x 8°15' — 8°55'N.

juv. ♂ Ado, 2100 ft., Ogaden.

Originally described from Dolo, Italian Somaliland, this species has since been recorded from other localities in that colony, from northern Kenya (Merelle River) and from the eastern districts of British Somaliland, east of the 44th meridian. It may ultimately prove to be a geographic race of *turcicus* which, in British Somaliland appears to be confined to the coastal zone of the north-west and the adjacent mountains of the Ogo. *H. turcicus* has, however, been recorded from Italian Somaliland (Scortecci, 1929, 1931; Calabresi, 1927) within the known range of *macropholis* and further collecting alone can decide whether or not the two intergrade. All the specimens were taken in dead trees or in termites' nests.

9. HEMIDACTYLUS species

♀, juv. Guban, 1500 ft. 43°E x 11°N.

These two specimens represent a species similar to *macropholis*, but differing in the possession of an even larger number of subdigital lamellae (10 under the inner, and 14 beneath the fourth toe), in having larger, more numerous dorsal tubercles, smaller ventrals, and a very distinctive colour pattern of broad, dark, transverse bars. In many characters, and especially in their colour, they resemble the Indian *H. triedruss* and *H. subtriedrus*, but do not appear to be referable to any described species. In the absence of a male, however, it is not possible to give an adequate description or to assess fully the relationships of the animal; so that, until further specimens are obtained, it must remain nameless. It appears to frequent dry, stony ground in a region completely devoid of vegetation.

10. HEMIDACTYLUS TURCICUS (Linn.)

Lacerta turcica Linn., 1758, Syst. Nat. (10), p. 202.

? *Hemidactylus puccionii* Calabresi, 1927, Atti Soc. Ital. Sci. Nat., 76, p. 23, pl. i, fig. 3.

♂, Berbera

11 ♂ ♂, 8 ♀ ♀ 42°50' — 43°15'E, 9°55' — 11°25'N, 150–4500 ft.

2 ♂ ♂, 4 ♀ ♀ Island off the coast at Zeilah.

The species was not found along the southern and eastern boundaries of British Somaliland, but appears to be confined to the north-western corner of the territory and to the coastal zone. With the exception of the specimen taken at Berbera, which was found in a bungalow, all the specimens were found among rocks or stones or hiding under dead logs.

The series shows a great deal of variation in the size of the dorsal tubercles and the extent to which they are keeled. In a series of 8 specimens from $43^{\circ}15' \times 11^{\circ}25'N$, there is every variation between examples with relatively large, regularly arranged, strongly keeled tubercles, and one specimen in which the tubercles are only about half as large and are but feebly keeled; among 7 others from $42^{\circ}50'E \times 10^{\circ}10'N$ most show the latter condition and two have the tubercles so small as to be scarcely perceptible and with barely a trace of a keel to be discerned. These recall, very strongly, the described condition of *Hemidactylus puccionii* Calabresi, from Italian Somaliland, and it is probable that this name is based on a small, smooth-tuberculate specimen of *H. turcicus*. No such individuals occur in the northern (Mediterranean) part of the range of *turcicus*, but in Somaliland they appear to form a considerable percentage of the total population and their occurrence may be taken to indicate the beginnings of racial differentiation, though this does not appear to be sufficiently well-marked to justify the use of trinomials.

11. HEMIDACTYLUS SINAITUS Boulenger

H. sinaitus Boulenger, 1885, Cat. Lizards Brit. Mus., 1, p. 126.

♂ $43^{\circ}15'E \times 10^{\circ}30'N$, 3000 ft. 18.iv.33.

juv. ♂ $43^{\circ}15'E \times 11^{\circ}25'N$, 150 ft. 9.i.34.

Anderson (1898, p. 83) showed that the characters originally used to distinguish *H. sinaitus* from *H. turcicus* were untenable when a large series was examined. He accordingly considered *H. sinaitus* to be a "variety" of *turcicus* and more recent authors have used the name *sinaitus* in a subspecific sense. But this practice does not seem to reflect the true relationships between the two, for the geographical range of *sinaitus* falls within that of *turcicus*. The above mentioned two specimens differ considerably from a series of *turcicus* (q.v.) found in the same region at the same time, notably in the degree of dilatation of the basal portion of the digits, and the length of the claw. They agree well with the type of *sinaitus* and, unless it can be shown that the digits of *turcicus* may vary enormously, it seems more reasonable to regard the two as distinct species. The accompanying figures, (5

and 6) one of the type of *sinaitus* and the other of a specimen of *turcicus* of comparable size, but selected on account of the unusually small

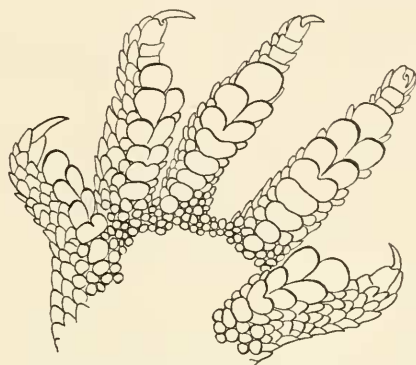


Fig. 5. *Hemidactylus sinaitus*. Left foot of Holotype.

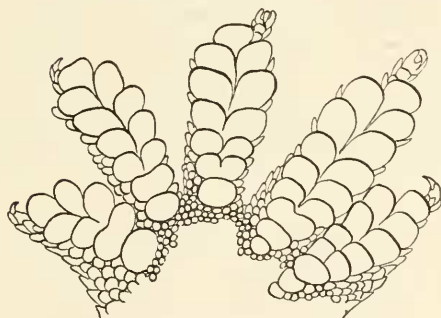


Fig. 6. *Hemidactylus turcicus*. Left foot of a female of a size comparable with the above.

number of its lamellae, reveal the differences better than any description. There are also certain other minor differences, thus:

H. turcicus

- a. Digits strongly dilated basally
- b. Claw short and stout
- c. Lamellae on the hallux 6-8, usually 7.
- d. Supranasals usually separated
- e. Scales on the snout small
- f. Preanal pores 6-8

H. sinaitus

- a. Digital dilatations small
- b. Claw long and slender
- c. Lamellae on the hallux 5-8, usually 5.
- d. Supranasals in contact
- e. Scales on the snout larger
- f. Preanal pores 2-6

Both the present examples were found among stones.

12. HEMIDACTYLUS CITERNII Boulenger

H. citernii Boulenger 1912, Ann. Mus. Genova, (3), 5, p. 329.

♂, 2 ♀ ♀ 43°15'E x 11°25'N, 150 ft.

The discovery of this species in the extreme north-west of British Somaliland is surprising. Hitherto it has only been reported from the Upper Juba province of Italian Somaliland (Rahanuin Country) and the eastern boundary of the British territory. The north-western specimens are, however, quite typical, and it may be that the species has a continuous range around the coastal zone; it must be either very rare in, or completely absent from, the Haud and the mountains of the Ogo.

13. HEMIDACTYLUS MABOUIA (Mor. de Jonnés)

Gecko mabouia Moreau de Jonnés, 1818, Bull. Soc. Philom., p. 138.

This cosmopolitan gecko, common throughout the Savannah provinces of Africa, is apparently rare in British Somaliland. It has been recorded at "Lasgore" (=Las Khoreh) by Vaillant, and Scortecchi (1931) mentions two individuals collected close to the Anglo-Italian boundary at El Donfar and Gardo; strangely enough it was not found by Capt. Taylor in this region. It seems very probable that humidity may be the limiting factor in the distribution of the species, its place being taken in the dry areas of the Eremian region and Somaliland by *H. turcicus*.

14. HEMIDACTYLUS SMITHI Boulenger

H. smithi Boulenger, 1895, Proc. Zool. Soc. London, p. 532, pl. xxix, fig. 2.

4 ♂ ♂, 6 ♀ ♀ Haud, 2100-2800 ft., 45°24'-46°25'E x 8°15'-8°32'N.

An arboreal gecko of the eastern and central Haud, Nogal Valley and Buran districts extending southwards to the Webi Shebeli (type locality). The largest specimen of the present series, a female, measures 57 mm. from snout to vent.

15. HEMIDACTYLUS JUBENSIS Boulenger

H. jubensis Boulenger, 1895, Ann. Mus. Genova, (2), 15, p. 10, pl. iii, fig. 1.

The record of this species from the Golis Mountains (Boulenger 1895b) appears to be based on a small-tubercled *H. turcicus* similar to those mentioned above. True *jubensis* is known only from the Ganale Doria, Milmil and Biornal, but since so many species with a similar distribution range into the Haud, its presence there may be expected.

16. *HEMIDACTYLUS FRENATUS* Dum. & Bib.

H. frenatus Duméril & Bibron, 1836, Erpet. Gén., 3, p. 366.

An oriental species which appears to have been introduced into the south of Italian Somaliland (Lower Shebeli province); it may also be found in British territory.

17. *HEMIDACTYLUS LAEVIS* Boulenger

H. laevis Boulenger, 1901, Proc. Zool. London, p. 48, pl. vii, fig. 1.

Originally found at "Ganlebar" (=Gaan Libah) in the Golis mountains this species has not been rediscovered in the British territories but has been reported from the south of Italian Somaliland (Dolo and the Rahanuin Country, Boulenger, 1912). If these latter two records are correct the species must have a considerable range and may be expected in very different types of country. But a mis-identification is to be suspected, and it seems highly probable that there has been a confusion with *H. fragilis* Calabresi, a closely similar species described from Bur Melde in the same general region.

18. *HEMIDACTYLUS SOMALICUS* Parker

H. somalicus Parker, 1932, Proc. Zool. Soc. London, p. 344.

A species closely allied to the preceding but known only from the Sol Haud, Nogal Valley and eastern Haud. Nocturnal and terrestrial.

19. *HEMIDACTYLUS MEGALOPS* Parker

H. megalops Parker, 1932, Proc. Zool. Soc. London, p. 345.

Another little known species of the Sol Haud and Nogal Valley.

TERATOLEPIS Günther 1869

Teratolepis Günther, 1869, Proc. Zool. Soc. London, p. 504 (type species *Homonota fasciata* Blyth).

Bunocnemis Günther, 1894, Proc. Zool. Soc. London, p. 85 (type species *Bunocnemis modestus* Günther).

Lophopholis Smith & Deraniyagala, 1934, Ceylon Journ. Sci., B, 18, p. 235 (type species *Teratolepis scabriceps* Annandale).

In north-east Africa there are known a few geckoes usually referred to the genus *Hemidactylus*, in which the dorsal scales are strongly im-

bricate. In this character they differ from all other members of the genus, and, in addition, they all have rather feebly dilated digits, though in this respect there is complete intergradation with the condition of normal *Hemidactylus*, through species such as *fragilis* Calabresi, *somalicus* Parker and *megalops* Parker. But there are also in the same zoo-geographical region two other geckoes in which the scales are imbricate and in which the digital lamellae are smaller still, and are, for the most part, undivided mesially; these have been referred to a distinct genus, *Bunocnemis*. But a new species in the present collection, described below as *taylori*, completely bridges the gap between *Bunocnemis* and the imbricate-scaled species of *Hemidactylus*. It is very closely allied to the type species of *Bunocnemis*, even to possessing enlarged scales on the back of the legs, but the digital lamellae are almost all divided and thus exhibit the same condition as is found in species like *ophiolepis* and *isolepis*. It might accordingly be considered advisable to unite *Bunocnemis* with *Hemidactylus*, or alternatively, to refer the imbricate-scaled species of *Hemidactylus* to *Bunocnemis*. But reference to the geckoes in other areas reveal the fact that similar species have received different generic names. Thus the Oriental *Teratolepis* differs from *Hemidactylus* in its imbricate scales, and undivided subdigital lamellae, and so is exactly comparable, and cannot be distinguished from a *Bunocnemis* whilst *Lophopholis* is simply an Oriental imbricate-scaled *Hemidactylus*. It thus becomes necessary to reconsider the status of these different genera. At first sight it might seem advisable to merge them all into *Hemidactylus*, for there is nowhere any hard and fast line whereby any one or all of them can be easily cut off. But the combination of imbricate scales and somewhat less highly developed digital pads suggests that we are, in fact, dealing with a natural group of primitive species, and it may perhaps be significant that the distribution of these primitive forms—West Africa, Somaliland, India—is somewhat similar to that of the primitive "Eublepharid" geckoes of the Old World.

The oldest group-name available for these imbricate-scaled species is *Teratolepis* and the various species may be distinguished thus:

- I. Tail root-shaped; dorsal scales obtusely keeled; digital lamellae undivided; preanal pores 6. *T. fasciata* Blyth
- II. Tail conical, tapering.
 - A. Dorsal scales quite smooth.
 1. Hinder side of thighs with enlarged tubercles; scales about the middle of the body 76-83 in ♂♂, 96-102 in ♀♀.

- a. Occiput and nape with numerous enlarged, flat scales, two or three times as large as the granules between them¹; subdigital lamellae undivided. *T. matschei* Tornier
- b. Occipital scales small, homogeneous.
- † Colouration uniform brown; subdigital lamellae for the most part undivided. *T. modesta* Günther
- †† A marked colour pattern of vertebral light spots and a labial stripe; subdigital lamellae almost all completely divided. *T. taylori* sp. nov.
2. Hinder side of thighs without enlarged tubercles.
- a. Scales about the middle of the body 50-58; preanal pores 8-22. *T. ophiolepis* Boulenger
- b. Scales about the middle of the body 62-65 in ♂♂, 67-77 in ♀♀; preanal pores 6-8. *T. isolepis* Boulenger
- B. Dorsal scales keeled or striated; subdigital lamellae divided.
1. Dorsal scales uniform, striated; scales at midbody 55 in ♂, 55-62 in ♀♀; preanal pores 6. *T. scabriceps* Annandale
2. Dorsal scales heterogeneous, strongly keeled.
- a. Enlarged scales feebly keeled, widely separated from one another; preanal pores 13-19. *T. squamulatus* Tornier
- b. Enlarged scales strongly keeled, larger than the interspaces between themselves; preanal pores 6-10.
. *T. tropidolepis* Mocquard

The only species of the genus found in British Somaliland are as follows:

1. TERATOLEPIS TAYLORI spec. nov.

Holotype a ♂, number 1937.12.5.305, in the British Museum, collected in the Haud (2100 ft., 46°20'E x 8°15'N) by Capt. R. H. R. Taylor on Jan. 26th, 1932.

Head once and a half as long as broad, somewhat depressed; snout longer than the distance from the eye to the ear, which is small and subcircular. Scales of the snout juxtaposed, large and polygonal; rostral quadrangular, with a median cleft; nostril pierced between the rostral, first upper labial and three nasals, of which the uppermost forms a suture with its fellow; seven or eight upper and six lower labials; mental large, pentagonal, followed by two large pairs of chin shields, of which the anterior pair form a long median suture; remainder of the

¹No typical material has been examined, but the character is found in a specimen from Zaria Province, N. Nigeria.

lower labials bordered by some enlarged scales. Scales of occiput and nape homogeneous, granular; dorsals smooth, a little larger than the ventrals; about 78 scales around the middle of the body. Limbs short, overlapping when adpressed. Digits short, very slightly dilated proximally and with divided lamellae, which grade insensibly into the granular scales of the palms and soles. The numbers under the digits¹ are: fingers 5, 6, 7, 7, 7, and toes 6, 7, 8, 8, 6, counting from the first to the fifth respectively. Distal phalanges of the fingers very short, but those of the toes very much longer and armed with very long, slender claws. Posterior surfaces of femora and tibiae with some enlarged, irregularly arranged tubercles. Tail conical, with smooth scales similar to those of the body. An angular series of 15 preanal pores and a single conical tubercle on each side of the base of the tail; post-anal bones and sacs present.

Brownish grey above; a light line along the upper lip continuing to the region above the arm. This light stripe is bordered above by a blackish stripe from the nostril, through the eye and above the ear, and beneath by an interrupted black line along the lower labials and backward as a series of small, widely spaced dots to the arm. A short whitish stripe from the eye along the temple; a V-shaped transverse bar on the occiput, followed by a series of six distinct, round or transversely oval, white spots along the vertebral line; tail with a median series of transversely oval spots anteriorly which give place to two alternating dorso-lateral series behind. Hinder side of the hind-limbs with circular white spots. Lower surfaces uniform white.

Length from snout to vent	46 mm.
Tail (reproduced terminally)	42 mm.
Fore-limb	11 mm.
Hind-limb	14 mm.

Paratypes:

A male with the same data as the holotype.

A female collected in the Haud (2700 ft., 45°29'E x 8°30'N) 4. VI.32.

A male collected in the Haud (3300 ft., 44°54'E x 8°42'N) 23. VII.32.

A female collected in the Haud (3800 ft., 44°24'E x 8°52'N) 11. IX.32

This short series shows some variation though the general features of pholidosis and proportions are similar. The number of scales about the body varies from 76 to 80 in males and from 96 to 102 in females. The relative sizes of the chin-shields and their shape varies, but the anterior pair always form a long median suture; upper labials vary from

¹These figures can only be given as approximations, since the proximal lamellae cannot be determined.

7 to 8 and lower labials from 6 to 7; femoral pores may be from 12 to 19; subdigital lamellae on the fingers and toes: Fingers I 4-5, II 6-7, III 7-8, IV 7, V 6-7; toes I 5-6, II 6-7, III 6-8, IV 6-8, V 5-6. The colour pattern is always similar to that of the type, the white labial stripe and its dark upper border being very constant. The temporal white mark is often indistinct and the vertebral white spots are usually transversely dilated and vary in number from 5 to 7. The dorsum may also have indefinite darker marks which may form a vertebral line between the white spots.

The species inhabits sandy country with scrub and patches of grass. All, except one of the specimens, were found on the ground in grass, the exception being discovered beneath a stone.

The nearest relative of this species is undoubtedly *T. modestus* from which it may be distinguished by the smaller size of the post-femoral tubercles, the divided sub-digital lamellae and the very distinctive colour-pattern. *T. modestus* is classed by Loveridge (1937, p. 492) as an inhabitant of the "wet and humid coastal plain", where it is found in piles of rubbish and rotting vegetation.

2. TERATOLEPIS OPHIOLEPIS Boulenger

Hemidactylus ophiolepis Boulenger, 1903, Ann. Mag. Nat. Hist. (7), 11, p. 55.

♂, ♀ Haud, 2900 ft. 45°15'E x 8°34'N

juv. ♂ Borama District, 4500 ft. 43°10'E x 9°55'N

These three specimens agree closely with the type and hitherto only known example of this species, except in the number of femoral pores. In the type there are 8 only, but in both the above-mentioned males there are 22. This is a greater range of variation than would have been expected, but, in the absence of any other distinguishing feature cannot be taken to indicate specific difference.

It appears to be a montane form, ranging from the Hawash River to the Mountains of the Ogo and the western Haud; the two examples from this latter region were found in a termite nest.

3. TERATOLEPIS ISOLEPIS Boulenger

? *Hemidactylus homoeolepis* (non Boulenger) Boettger, 1893, Zool. Anz. 426-417, p. 114.

Hemidactylus isolepis Boulenger, 1895, Proc. Zool. Soc. London, p. 531, pl. xxix fig. 1.

♂ Borama District, 5000 ft., 43°10'E x 9°55'N

♂, ♀ Borama District, 5300 ft., 43°15'E x 9°50'N

These examples show little variation beyond that recorded for the species in the Lake Rudolf region (Parker, 1932a, p. 223). In the two males the number of scales about the middle of the body is 59 or 60 and in the female about 81, rather irregularly disposed; the femoral pores are six and the number of subdigital lamellae slightly smaller.

In British Somaliland the species appears to be a montane form, only having been reported at Gaan Libah (5900 ft.) in addition to the foregoing records from the Borama District. It has also been recorded from the mountainous Harar region, but in the south it extends into the lowlands at Lugh, around Lake Rudolf and at Archer's Post (Kenya Colony).

4. TERATOLEPIS TROPIDOLEPIS Mocquard

Hemidactylus tropidolepis Mocquard, 1888, Mem. Cent. Soc. Philom. Paris, p. 113.

6 ♂ ♂, 3 ♀ ♀ Haud, 2200-2500 ft., 45°50'-46°9'E x 8°00'-8°21'N

2 ♂ ♂ Ado, 2100 ft., 45°15'E x 7°20'N

These 11 specimens agree with the series previously collected by Capt. Taylor in the Nogal Valley (Parker, 1932, p. 342) except that the differences in pholidosis noted there are found not to be correlated with sex, as was then supposed, and in a slightly greater range of femoral pores, 6 to 10. Probably the value of femoral pores in distinguishing the species of this genus and of *Hemidactylus* has been over-rated (c.f. *Teratolepis ophiolepis*, *supra*) so that the view previously expressed, that *squamulatus* Tornier may be distinguished from *tropidolepis* by the greater number of pores, has less to support it. The very strong keeling of the dorsal scales, their size and linear arrangement are, however, quite characteristic of *tropidolepis*, though the geographical distribution of the two suggests that Calabresi's (1924) interpretation of them as subspecies may prove to be a correct one. *T. tropidolepis* is known from the Haud and Nogal Valley in British Somaliland, ranging southwards through the Ogaden to Bardera, Dolo, the lower Webi Shebeli and northern Kenya; it appears to frequent sandy country with patches of grass and thorn scrub and is probably nocturnal, being found by day concealed under stones or logs. *T. squamulatus* has been recorded from the Anglo-Egyptian Sudan, Uganda, Kenya and Tanganyika Territory; Loveridge (1937) classes it as a form of the coastal plains and upland savannahs.

HEMITHECONYX Stejneger

This genus contains but two known species, one confined to the Sudanese districts west of Nigeria, and the other to the Somali Peninsula.

HEMITHECONYX TAYLORI Parker

H. taylori Parker, 1930, Ann. Mag. Nat. Hist. (10), 6, p. 603; Scortecchi, 1931, Atti Soc. Ital. Sci. Nat., 70, pl. iii.

2 ♂ ♂, ♀	Oadwenia, 3500 ft., 45°05'E x 9°24'N
♀	Haud, 2100 ft., 46°19'E x 8°14'N
♂	Hargeisa, 4100 ft., 44°E x 9°35'N

This species seems to be almost confined to British Somaliland. It has been recorded in addition to the above-mentioned specimens from the Nogal Valley, Buran district and Sol Haud, in the British Protectorate and from Gardo in Italian Somaliland close to the border. It is probably extensively distributed in the northern parts of the Ogaden also, but owing to its nocturnal habits has not been collected. During the day time it is usually found concealed beneath stones and when disturbed emits a coughing noise; the three examples taken at Oadwenia in January were found together 3 feet underground where they were presumably aestivating through the dry season.

Holodactylus

- I. Upper surface of the head flat; 13-18 upper labials.....
*H. cornii* Scortecchi
- II. Upper surface of the head convex; 9-11 upper labials.....
*H. africanus* Boettger

1. HOLODACTYLUS CORNII Scortecchi

H. cornii Scortecchi, 1931, Atti Soc. Ital. Sci. Nat., 70, p. 137, fig.

The status of this species is somewhat doubtful (c. f. *H. africanus* below); it is known from the vicinity of Obbia and near Gardo in Italian Somaliland and from the Nogal Valley in the British Protectorate.

2. HOLODACTYLUS AFRICANUS Boettger

H. africanus Boettger, 1893, Zool. Anz., 16, p. 114.

H. aculeatus Calabresi, 1915, Mon. Zool. Ital., 26, p. 238, fig.

4 ♂ ♂, 8 ♀ ♀	Haud, 2100-3800 ft., 44°24'-46°20'E x 8°15'-8°52'N
♂	Guban, 3000 ft., 42°35'E x 10°40'N
2 juvs.	Burao, 3500 ft., 45°33'E x 9°31'N

Scortecci (1931, p. 134) has drawn attention to the fact that, in a series of *Holodactylus africanus* from Italian Somaliland, one example from the Lower Shebeli Province (Villagio Duca Abruzzi), in the extreme south, has the dorsal granules perfectly smooth, whereas in others from near Obbia and Gardo (i.e. further north) the granules are covered with confluent rugosities. In the series available to the present author it is also noticed that all the specimens from the Haud and Nogal Valley have the dorsal granules beset with rugosities which often culminate in a distinct median keel, whereas in another example from the Rahanuin country (approximately $3^{\circ}30'N$ x $43^{\circ}30'E$) the dorsal granules are quite smooth. But, in addition, eight examples from the extreme north (Guban and mountains of the Ogo) resemble the southern form in having the granules quite smooth. Thus, once again, there is apparently the beginning of racial differentiation, with the mountain chain south of the Guban forming a boundary line.

The series also shows variation in other respects, though these differences cannot be correlated with geography. The supranasal shields are by no means constant. In the present collection those from the western Haud show every condition between large, well marked supranasals and their complete absence, and among those from the Guban only one specimen has them developed. The length of the tail, too, shows considerable variation and this cannot, as has been suggested (Parker, 1932, p. 350) be correlated with seasonal change, but appears rather to be an age character. In two juveniles, measuring 42 and 47 mm. from snout to vent, it is 38 per cent and 36 per cent of the length of the head and body, and there is an almost regular decrease with increasing size to 29 per cent and 30 per cent in the two largest individuals which measure 83 and 85 mm. respectively from snout to vent. The length of the tail relative to its breadth varies from 2.8 to 4.0 in the nine specimens collected in the Haud during April, and this range of variation is sufficiently great to include all variations at other times of the year, except in very young specimens where, on account of the proportionally greater length of the organ, the length-breadth ratio may be as high as 5.0 to 5.3.

The fact that the supranasals are so inconstant in their degree of development and the tail so variable in its size indicates the possibility of *H. cornii* no longer being tenable. But no examples with the flat head ascribed to *cornii* have been seen which can be definitely linked with *africanus*.

The species ranges from the sea in the north and east to the Juba River and westwards to about $43^{\circ}30'E$ (type locality) in the central

Ogaden. It is nocturnal and was found by Capt. Taylor usually in the vicinity of termites' nests feeding on the winged insects as they emerge.

Lygodactylus

- I. A single series of enlarged plates beneath the unregenerated tail. *L. picturatus*
 II. A double series of enlarged plates beneath the tail. *L. somalicus*

LYGODACTYLUS PICTURATUS

Hemidactylus picturatus Peters, 1870, Mon. Ak. Berlin, p. 115.

Lygodactylus picturatus, or one of its races, has been recorded on several occasions from Somaliland (Scortecci, 1931, idem, 1930; Boulenger, 1891; idem, 1895; idem, 1896; Mocquard, 1888; Calabresi, 1915; idem, 1927) but the majority of these records are from the south of the Italian colony and none are definitely within the British area. It is almost certain that the most northerly record (Boulenger, 1891) is in reality based on an example of the following species.

LYGODACTYLUS SOMALICUS Loveridge

L. somalicus Loveridge, 1935, Proc. Biol. Soc. Washington, 48, p. 195.

L. somalicus annectens Loveridge, loc. cit., p. 197.

7 ♂ ♂, 5 ♀ ♀ Haud, 2100-3900 ft., 44°20'E-46°25'E x 8°15'-8°52'N

Until 1935 this species had been recorded from Somaliland as *L. capensis*, *L. scheffleri*, *L. conradti* or *L. picturatus* (Boulenger, 1891). But Loveridge then showed that the *Lygodactylus* of Somaliland is distinct. At the same time he recognised two races, one, the typical, ranging from the Nogal Valley to Bera in Italian Somaliland and the other, *annectens*, from the Buran District to the Juba River, i.e. from localities to the north, east and south of the typical form. The two were said to be distinguished by the condition of the mental, fissured only in *annectens*, but completely divided in the other. The present series, from localities to the west of the type locality, has the mental deeply fissured, and re-examination of five paratypes of the typical race shows that in three of these also the suture is incomplete, though a fold, probably due to the manner of preservation, connects the ends of the fissures and simulates a complete suture. Accordingly the validity of the two races must be considered very doubtful indeed; in some individuals the two fissures may unite to sever the mental completely, but normally this is not the case.

This species does not appear to extend westwards or northwards over the mountain ranges which border the Haud, and ranges southwards to the Juba River. In British Somaliland it has been recorded across the Haud from 44° 20' E to the Nogal Valley northwards to the Buran District and Burao. It is essentially diurnal and arboreal.

PLATYPHOLIS FASCIATA ERLANGERI (Steindachner)

Homopholis erlangeri Steindachner, 1906, Ann. Hofmus. Wien, **21**, p. 149, pl. vii.

Until recently (1932) *erlangeri*, originally described from specimens taken near "Umudu" (= ?Afmadu) close to the Juba River, was considered a synonym of *fasciata* and all Somali records of the former appear under the latter name. Typical *fasciata* is a southern form, found in Kenya and Tanganyika Territory, whereas the specimens from British Somaliland examined by the author agree in colour with *erlangeri*. Where the two intergrade is uncertain.

The species is arboreal and known in British territory only from the Sol Haud and Buran.

Pristurus

- I. Rostral shield entering the anterior border of the nostril.
 - A. Tail strongly compressed with a crest of lanceolate scales longer in males than in females; adult males usually have the crest carried forwards on the dorsal line of the body and females may have a row of enlarged scales. *P. flavipunctatus*.
 - B. Tail scarcely compressed, with a feeble crest or row of enlarged scales in males only, never extending on to the body *P. rupestris*.
- II. Rostral shield excluded from the nostril.
 - A. Claws much longer than the unguis scales; digits long and slender; 18-23 lamellae beneath the fourth toe. *P. crucifer*.
 - B. Claws shorter than the unguis scales; digits short; 14-19 lamellae beneath the fourth toe. *P. phillipsi*.

1. *PRISTURUS FLAVIPUNCTATUS* Rüppel

Pristurus flavipunctatus Rüppel, 1835, N. Wirbelthiere Fauna Abess., Amph., p. 17, pl. vi, fig. 3.

Pristurus percristatus Boulenger, 1896, Ann. Mus. Genova, (2), 16, p. 547.

Pristurus percristatus pseudoflavipunctatus Scortecci, 1935, Atti Soc. Ital. Sci. Nat., 74, p. 123.

♂, ♀	Burao, 3500 ft.
♂, ♀	Bohodle, 2100 ft.
8 ♂ ♂, 2 ♀ ♀	Haud, 2200-3900 ft. 46°25'-44°20'E 8°15'-8°55'N
4 ♂ ♂, 2 ♀ ♀	Borama District, 5000 ft. 43°20'E 9°50'N
2 ♂ ♂	Ado, 2100 ft. 45°15'E 7°20'N
♂, ♀	Near Zeilah, 150 ft.

In a previous paper (1932, p. 347) the author referred certain specimens from British Somaliland to *P. percristatus* Boul. with an element of doubt, for they had much less developed vertebral and caudal crests than typical *percristatus* and so appeared to approach the condition of *flavipunctatus*. Scortecci discovered a similar condition in specimens collected at various localities in Italian Somaliland and considered the differences to be constant and to indicate the existence of a distinct southern subspecies which he called *pseudoflavipunctatus* (Scortecci, 1935, p. 123) and which differed from the typical Eritrean form in its smaller size, less developed caudal and dorsal crests and the abdominal scales being granular instead of flat and subimbricate.

The new material now available makes it evident that the height of the dorsal and caudal crests is variable, probably with age. Thus of the four males collected together in Lat. 8° 35' N., Long. 46° 25' E two have long spines in the dorsal crest (measuring 0.04-0.045 mm. at midbody) whereas in the other two the spines are scarcely more than enlarged granules and are only half as long (0.015-0.025 mm.); further, the two with the shorter crests are smaller animals (28-30 mm. as compared with 31 and 32 mm. from snout to vent). Similarly of the four males collected in the Borama District, two examples measuring 35 mm. from snout to vent have dorsal spines of 0.030 to 0.045 mm., whereas the smallest of the series measuring 30 mm. has a very much shorter crest, 0.015 mm. high, and of the two from Ado the larger, measuring 32 mm. has a crest of 0.04 mm. and the smaller, 30 mm., has a crest of only 0.02 mm. Of the whole series examined, no male of less than 30 mm. has a crest of more than 0.025 mm., whereas in examples of more than 30 mm., the length of the crest varies from 0.03 to 0.045 mm. The only remaining character utilised by Scortecci to distinguish "*pseudoflavipunctatus*" is the condition of the ventral scales. Boulenger

(1896, p. 549) has considered the same character to be valueless in the allied species *P. collaris*, and the present series has examples which by the length of the dorsal crest are typical *percristatus* but have the ventral condition of *pseudoflavipunctatus*. Accordingly it seems probable that the length of the dorsal crest increases with age and the range of variation with growth is large enough to include the described conditions of *percristatus*, *percristatus pseudoflavipunctatus* and *flavipunctatus*. Thus, the 5 cotype males of *percristatus* available to the author measure 34–35 mm. from snout to vent and have spines in the dorsal crest of 0.034 to 0.045 mm., and so resemble exactly the largest males of the present series. The cotypes of *percristatus flavipunctatus* are smaller, ranging in size from 24 to 34 mm. and have a shorter crest of the order of 0.01 to 0.02 mm., and the largest type of *flavipunctatus*, also with a short crest, is 29.1 mm. from snout to vent. There can be little doubt that these three names all refer to the same species of the genus in northeast Africa. It is probable that some records of *flavipunctatus* refer to the terrestrial *rupestris*.

The species is, as mentioned above, arboreal and, like all members of the genus, diurnal and particularly agile and swift in its movements. It ranges from the Anglo-Egyptian Sudan to Italian Somaliland as far south as Dolo, and south-eastern Arabia. In the British Protectorate it appears to be widely distributed in all areas where acacias are to be found from sea-level to 5000 feet.

2. PRISTURUS RUPESTRIS Blanford

P. rupestris Blanford, 1874, Ann. Mag. Nat. Hist. (4), 13, p. 454.

P. flavipunctatus (non Rüppel) Parker, 1932, Proc. Zool. Soc. London, p. 347.

? *P. migiurtinicus* Scortecci, 1935, Atti Soc. Ital. Sci. Nat. 74, p. 121.

6 ♂ ♂, 4 ♀ ♀	Borama District, 5000 ft., 43°10'–43°25'E x 9°50'–9°55'N
2 ♀ ♀	Ogo, 5000 ft. 43°E x 10°05'N
♀	Guban, 150 ft., 43°15'E x 11°25'N

This species has only once previously been recorded from Somaliland under the name *rupestris*, by Scortecci (1935, p. 119) who gave a full description of his single male in the belief that it might represent a distinct geographical race. It seems probable that he was led to this conclusion by comparison with the so-called *rupestris* of Sokotra, from which Somaliland examples of *rupestris* do indeed differ in the characters he mentions, i.e. a less depressed head, the length of the digits and a lower number of subdigital lamellae. But as the author has recently shown (1938) the gecko of Sokotra is really referable to a

distinct species, and comparison of the Somali material with a long series from Arabia, from Aden to the Persian Gulf, fails to reveal any differences which might indicate racial differentiation. The number of subdigital lamellae in the present series varies from 18-21 beneath the fourth toe and in the 30 Arabian examples from 18-24.

These small, diurnal geckoes are terrestrial, and though widely distributed from Karachi through southern Iran and the islands of the Persian Gulf to south-eastern Arabia, they appear to be confined to the coastal plain and mountain zone of Somaliland; no specimens have been recorded from the districts to the south of the mountains.

3. PRISTURUS CRUCIFER (Val.)

Gymnodactylus crucifer Valenciennes, 1861, Compt. Rend. Ac. Paris, **52**, p. 433.

Pristurus stefaninii Calabresi, 1927, Atti Soc. Ital. Sci. Nat., **66**, p. 21.

17 ♂ ♂ 9 ♀ ♀ from various localities in the Haud from Burao to Ado and in the mountains of the Borama District at altitudes of from 2100 to 5300 ft.

Scortecci (1935, p. 133) has drawn attention to the fact that, although this species is generally characterised by a claw much longer than the penultimate phalanx there are certain individuals which have a shorter claw, produced by wear. As might be expected, this is largely correlated with the substratum on which the animal lives, and in the present series very long, pointed, scarcely curved claws are found on those specimens collected in sandy country, shorter, blunter claws on individuals from localities of stony sand and the shortest claws of all on those from rocky localities.

A wide-spread species occurring throughout the Somali Peninsula and extending north-westwards to Eritrea and into south-eastern Arabia.

4. PRISTURUS PHILLIPSI Boulenger

P. phillipsi Boulenger, 1895, Ann. Mag. Nat. Hist. (6), **16**, p. 165, pl. vii, fig. 1.

P. crucifer (part) idem, 1891, Ann. Mus. Genova, (2), **12**, p. 6.

P. somalicus Parker, 1932, Proc. Zool. Soc. London, p. 349.

P. phillipsi somalicus Scortecci, 1935, Atti Soc. Ital. Sci. Nat., **74**, p. 152.

♀ Haud, 2100 ft., 46°20'E x 8°15'N

Scortecci (*loc. cit. supra*) has given reasons for considering *somalicus* and *phillipsi* to be conspecific, though he prefers to retain the two names, using them subspecifically. But both forms occur together in the same localities so that they can hardly be true subspecies. They

may well be ecological races confined to different habitats, but whether trinomials can properly be used for such modifications seems doubtful. There is no generally recognised method of designating such races and to use the same notation as is used for subspecies, must inevitably lead to confusion. For the present, at least, it seems advisable not to attempt to label these little understood variants.

P. phillipsi is known only from the Somali Peninsula, ranging from Dorianle in the south (Calabresi, 1915) to the Golis Mountains near Berbera and thence eastwards to the coast.

PTYODACTYLUS HASSELQUISTI (Donndorff)

Lacerta hasselquisti Donndorff, 1789, Zool. Beytr. Leipzig, 3, p. 133.

2 ♂ ♂, 4 juvs. Guban, 150–3500 ft., 42°40'E–43°15'E x 10°30'–11°25'N

This gecko has only once previously been collected in Somaliland, by Neumann in the area between Zeila and Jaldessa (Tornier, 1905; Neumann, 1905). Though widely distributed over Northern Africa, Palestine, Syria and Arabia, it does not appear to have extended its range eastwards beyond the Danakil depression. Tornier and Neumann referred their specimens to the "*var. ragazzi*", but Flower (1933, p. 763) has recently pointed out the impossibility of connoting the numerous local races of this species in Egypt by trinomials.

TARENTOLA ANNULARIS (Geoffroy)

Gecko annularis Geoffroy, 1827, in Savigny, Descrip. d'Egypte, 1, Rept., p. 130, pl. v, figs. 6, 7.

? *Platydactylus delalandii* Vaillant, 1882, Miss. Revoil Pays Comalis, p. 14.

Tarentola ephippiata (non O'Shaughnessy) Boulenger, 1895, Ann. Mag. Nat. Hist., (6), 16, p. 106; idem, 1901, Proc. Zool. Soc. London, (i), p. 49.

9 ♂ ♂, 8 ♀ ♀, 3 juvs. from the Borama District and various localities along the boundary between this region and Zeilah at altitudes of from sea level to 5000 ft.

Vaillant's record of *Tarentola delalandii* from Lasgore (= Las Koreh) cannot be accepted; as Boulenger (1921, p. 60) has pointed out there is no doubt that many of the specimens recorded by Vaillant did not originate in Somaliland. But if the specimens really were taken at Las Koreh, they ought probably to be referred to *T. annularis*. In addition to this doubtful record two other species of *Tarentola* have been reported from Somaliland; but reexamination of the material in the British Museum fails to reveal more than one, for the records of *T. ephippiata* (indicated above) are based on specimens of *annularis*.

There seems to be no doubt that the West African *T. ephippiata* ranges into the Anglo-Egyptian Sudan, whence it has been recorded many times, but it seems probable that it ought to be deleted from the list of species inhabiting the Somali Peninsula.

The genus *Tarentola* is remarkable among the geckoes for the degree of development of the osteoderms. Hitherto these have not been recorded in the family except as irregularly scattered developments. In *T. annularis*, however, they form a complete armour over the body and limbs. In other families of lizards where a similar armour is developed the bony scutes are large and correspond in size and position with the external scales. But here again *Tarentola* is unique, for only on the upper eyelid is this correspondence to be found. Elsewhere the osteoderms are minute, and bear no relation to the scales overlying them. In a female specimen measuring 78 mm. from snout to vent the ventral osteoderms are roughly square, with rounded corners and measure approximately 0.1 to 0.13 mm. along each side; from 30 to 40 correspond with each scale at the middle of the belly. Dorsally the osteoderms are similar in size but are less regular in shape, being subhexagonal or rounded, and the number underlying the external scales varies, naturally, with the size of the latter.

The species has only been reported from the coastal plain and the adjacent mountains in British Somaliland; its centre of distribution is the Egyptian region and the Ogo and Guban are the limits of its distribution to the east, where it has apparently failed to penetrate into the Haud and Ogaden.

TROPIOCOLOTES

Since Boulenger recorded a rough-scaled *Tropiocolotes* from Biji, Somaliland, in 1901, the species has not been re-discovered there until the present time, and no further records have appeared which bridge the distributional gap between this area and northern Egypt. These rough-scaled geckoes have a wide distribution over northern Africa, but there is some evidence that there may be several species or geographical races. The material available can be subdivided as follows:

- I. Anterior chin-shields large, reaching and forming a long suture with the second lower labial; posterior chin-shield completely separated from the first lower labial. Scales about the middle of the body 44-48. Distribution: Tunisia, Libya, N. Egypt (8 specs.).....*T. tripolitanus* Peters¹

¹Vinciguerra (1931, p. 251) regards *T. nattereri* Steindachner as a synonym of *tripolitanus*; but it is described and figured as having smooth scales so that this disposition of the name cannot be maintained.

- II. Anterior chin-shields usually not reaching the 2nd lower labial; posterior chin shields, when present, usually in contact with both the first and second lower labials. Scales about the middle of the body 35-41.
- A. Posterior chin-shields obvious; supraorbital scales smaller than those on the interorbital region, juxtaposed. Distribution: Western British Somaliland. *T. somalicus* spec. nov.
- B. Posterior chin-shields hardly distinguishable from the gular scales. Supraorbital scales larger than those of the interorbital region, imbricate. Distribution: Rio de Oro.
 *T. occidentalis* spec. nov.

It may ultimately prove that these two new "species" are only geographical races of *tripolitanus*, or that there is a single race ranging from the extreme east to the west of the continent to the south of the typical form. Certainly the two bear a greater resemblance one to another than either does to *tripolitanus*, but the differences appear sufficient to justify the present tentative arrangement.

TROPICOLOTES SOMALICUS spec. nov.

Tropicolotes tripolitanus (non Peters) Boulenger, 1901, Proc. Zool. Soc. London, p. 48.

The holotype of *T. somalicus* is a male, number 1937.12.5.693 in the British Museum from 42° 50'E, 10° 20'N at an altitude of 3000 ft.; collected by Capt. R. H. R. Taylor 27. vii.33.

Snout a little longer than the distance between the eye and the ear. Head covered with keeled granules; rostral broader than high, with a median cleft; nostril pierced between the rostral, first upper labial and 2 small nasals; seven upper and six lower labials; mental large, triangular, followed by a pair of large chin-shields which form a median suture; posterior chin-shields much smaller and widely separated, making contact with the first and second lower labials. Scales of the body, both dorsal and ventral, large and strongly keeled, about 37 round the middle of the body, 4 of the largest dorsals equal in length to the distance between the nostril and the anterior border of the eye. Limbs covered with strongly keeled scales; hind-limb reaching the elbow; subdigital lamellae tricarinate.

Grey-brown above, with a few darker flecks; a dark brown band from the nostril through the eye, above the shoulder; upper lip white,

brown spotted; anterior border of eye white; tail with alternating light and dark transverse bars; lower surfaces white, with a few, very small dark dots.

Length from snout to vent	28 mm.
Tail (regenerated)	35 mm.
Fore-limb	9 mm.
Hind-limb	14 mm.

The paratypes are all very similar in general proportions; their localities, sexes and scales about the middle of the body are:

43°E x 10°45'N, 3000 ft. 2 ♀ ♀, ♂ 37, 39, 41.

43°15' x 11°25'N 150 ft. 2 ♂ ♂, ♀ 39, 35, 35.

Biji ♀ 36.

The species appears to have a very limited distribution and to be confined to the very arid country of the coastal zone; all the specimens were taken in the ground in sandy country with patches of stones and almost devoid of vegetation.

TROPIOCOLOTES OCCIDENTALIS spec. nov.

Tropiocolotes tripolitanus (non Peters) Günther, 1903, Novit. Zool., 10, p. 298.

Holotype a male, number 1908.6.13.15 from the Rio de Oro, collected by Herr Riggenbach.

Snout a little longer than the distance between the eye and the ear. Head covered with feebly keeled, imbricate scales; rostral broader than high, with a median cleft; nostril pierced between the rostral, first upper labial and two small nasals; seven upper and six lower labials; mental large, triangular, followed by a pair of chin shields which form a median suture and do not reach the second lower labial; posterior chin-shields absent. Scales of the body, both ventral and dorsal, large and strongly keeled, about 41 around the middle of the body, $4\frac{1}{2}$ of the largest dorsals equal in length to the distance between the nostril and the eye. Limbs covered with strongly keeled scales; hind limb reaching between the elbow and the wrist; subdigital lamellae tricarinate.

Pale straw-colour above; a brown band from the eye, above the shoulder; upper lip and anterior border of the eye whitish; dorsum with a series of about seven indefinite, wavy, transverse brown bars; tail with regular brown cross-bars; lower surfaces of head and body white, of the tail pale brown.

Length from snout to vent	30 mm.
Tail	36 mm.
Fore-limb	9 mm.
Hind-limb	13 mm.

The paratype is a juvenile male from the same locality as the holotype. It agrees with the latter except in having 40 scales round the body, a slightly longer hind-limb (the third toe reaches the elbow) and in having the dorsal cross-bars less distinct and broken up into blotches.

AGAMIDAE

Agama

- I. Tail longer than the head and body, not depressed.
 - A. A distinct crest of enlarged, lanceolate scales on the nape.
 *agama spinosa*
 - B. No nuchal crest, or only a few spinose, not lanceolate scales.
 1. A dorso-lateral fold from the sides of the neck to the groin; dorsal scales heterogeneous.
 - a. Whole of the dorsum beset with large spines each of which has a ring of smaller spines at its base. *A. robecchii*
 - b. Spines, if present, confined to the dorso-lateral fold.
 - i. Dorsum, between the dorso-lateral folds and flanks, with scattered, slightly enlarged scales.
 *A. cyanogaster*
 - ii. Mid-dorsal area without scattered enlarged scales.
 - † Flanks with a few scattered, enlarged scales; a golden mid-dorsal stripe. Adult males *circa* 70–90 mm. *A. phillipsi*
 - †† Flanks covered with uniform, small smooth scales. Adult ♂ *circa* 110–120 mm. *A. annectans*
 2. No dorso-lateral fold; dorsal scales large and homogeneous.
 - a. Spines about the ear partially concealing it, and as long as the diameter of the eye opening; adult ♂♂ 58–88 mm.; ♀♀ 76–88 mm. *A. rupepelli rupepelli*
 - b. Spines about the ear only half as long as the eye opening and not encroaching upon the tympanic area; tympanum fully exposed; adult ♂♂ 43–54 mm., ♀♀ 56–64 mm.
 *A. persimilis*
- II. Tail much shorter than the head and body, strongly depressed, with a disc-like basal portion.
 - A. Basal portion of the tail longer than broad, merging gradually into the terminal filament, with marginal spines not markedly greater than those on its upper surface. *A. batillifera*

B. Basal portion of the tail broader than long, abruptly differentiated from the terminal filament and with very large marginal spines.

A. taylori

In addition to these species Vaillant (1882) reports *Agama agilis* and *A. ruderata* from Las Goré (= Las Khoreh). But these records seem very improbable and the species have been omitted from consideration.

The following species may ultimately be found in the Protectorate also:

<i>Agama bottegi</i> Boulenger	Type locality: Lugh
<i>Agama cornii</i> Scortecci	“ “ Om-Ager, Eritrea
<i>Agama lionotus</i> Boulenger	“ “ S. E. of Lake Rudolf
<i>Agama zonura</i> Boulenger	“ “ “Wardergubbornor”

(This may be the “Wal da Gubora’s Capitol” in 7°10’N x 40°41’E, approximately, shown on Donaldson Smith’s map in the Geographical Journal 1895, 5, p. 124, otherwise known as Gineh, Ginea, or Ginir. The species has also been recorded from Harrar (Tornier 1905; Erlanger 1905).

1. AGAMA AGAMA SPINOSA Gray

Agama spinosa Gray, 1831, in Griffith, Cuvier’s Animal Kingdom, 9, Syn., p. 57, pl.

Agama colonorum Boulenger, 1895b; *idem*, 1898; Tornier, 1905; Neumann, 1905; Scortecci, 1929.

Agama hartmanni (nec Werner, nec *doriae* Boul.) Boulenger, 1901.

15 ♂♂, 6 ♀♀, 11 juvs. from various localities along the boundary northwards and westwards from the Borama District (43°10’E x 10°N) to 43°15’E x 11°15’N, at altitudes of from 500 to 5000 feet.

Flower (1933, p. 772) has expressed the opinion that *Agama spinosa* Gray may be one of the numerous local races of the wide spread *Agama agama*. This certainly seems very probable, and explains how it is that the three closely allied forms *A. spinosa*, *A. colonorum* (= *A. agama*) and *A. hartmanni* have all been recorded from British Somaliland. These three forms have all been recorded from the same general area, the costal plain and adjacent mountains, and it seems highly probable that only a single species is involved. The correct name to apply to this would appear to be *spinosa* Gray, though it must be admitted that many specimens from Somaliland differ widely from typical *spinosa* in having a much shorter nuchal crest, shorter spines about the ear and smaller, less strongly keeled dorsal scales. But the above-mentioned large series shows an enormous amount of variation in these characters

and yet appears to represent but a single species; the variations cannot be correlated with diversity of habitat nor with altitudinal distribution. Loveridge (1936, p. 54) has stated that in his experience the variation of the number of scales around the middle of the body of any one race of *Agama agama* is 10, rarely as many as 13, in a given area. Yet the present series varies from 59 to 80 in this respect and other examples from near Berbera and the Golis Mountains extend this range up to 90; I am unable to detect any discontinuity which would indicate that two species are involved. In typical *spinosa* from the Egyptian region the number of scales around the middle of the body varies from 62 to 74 (18 specs. examined).

In a previous publication (1932) the author placed *agama smithi* in the synonymy of *A. spinosa*, but it is doubtful whether this disposition is justified.

Agama agama spinosa is strictly terrestrial, and an inhabitant of rocky and stony districts. As pointed out above, it is confined to the coastal plain and maritime mountains, as far east as the Wagar range, a distribution characteristic of so many other Eremian species which have failed to extend their range into the Haud and south-eastern drainage.

2. AGAMA ROBECCHII Boulenger

Agama robecchii Boulenger, 1891, Ann. Mus. Genova, (2), 12, p. 6, pl. i, fig. 1.

This species appears to have a very limited distribution in the sultanates of Obbia and Migiurtina and has only once been recorded in British Somaliland, from Gumbi Hill (10°16'N x 47°12'E).

3. AGAMA CYANOASTER (Rüppell)

Stellio cyanogaster Rüppell, 1835, N. Wirbelthiere Fauna Abess., Amph., p. 10, pl. v.

Agama atricollis A. Smith, 1849, Ill. Zool. S. Africa, Rept., App., p. 144.

♀ 43°E x 10°10'N.

Boulenger as long ago as 1896c, pointed out that *cyanogaster* appeared to pass completely into *atricollis* and suggested that the two might have to be united. Specimens have been recorded from the Ethiopia-Somali region under both names and Loveridge (1936, p. 57) maintains that the two are distinct species, *cyanogaster* being a much smaller form, measuring not more than 70 mm. from snout to vent. It seems highly probable, however, that Loveridge's "*cyanogaster*" is really *phillipsi*, for the type of *cyanogaster* measures 113 mm.

A. cyanogaster, including *atricollis*, is widely distributed over eastern Africa from the Cape Province to the mountains of Ethiopia and Eritrea. It has only previously been recorded (as *atricollis*) from British Somaliland in the extreme east, at Buran and Taleh by Calabresi (1927, p. 27); one of the same specimens was apparently referred by Scortecci (1931, p. 142) to *cyanogaster*. It is possible, however, that this identification is incorrect, for Capt. Taylor failed to collect the species in that region though the allied *A. annectans* was plentiful, but was not reported by either Scortecci or Calabresi.

4. AGAMA PHILLIPSI Boulenger

Agama phillipsi Boulenger, 1895, Ann. Mag. Nat. Hist., (6), 16, p. 567, pl. vii, fig. 3.

A. cyanogaster (non Rüppell) Loveridge, 1936, p. 57.

7 ♂♂, 12 ♀♀, 10 juvs. from various localities in the Borama district (43°-43°25'E x 9°50'-10°10'N) at altitudes of from 4500 to 6000 ft.

This series is very constant in its general characters and colour. There is, however, an appreciable amount of variation in the number and size of the enlarged, keeled scales on the flanks and femora; but they are constantly present and serve to distinguish this species from *annectans* which has uniform small scales in both these regions. The absence of enlarged scales between the dorso-lateral folds distinguishes it from *cyanogaster*.

A. phillipsi appears to be a montane species, ranging from Eritrea through the mountains of north-eastern Ethiopia to the Ogo as far east as the Golis Range; no specimens have ever been reported from the Haud or the lower lying areas to the south and east. Its depressed habitus reflects its habit of hiding in rock crannies; the diet appears to consist principally of ants.

5. AGAMA ANNECTANS Blanford

Agama annectans Blanford, 1870, Zool. Abyssinia, p. 446, fig.

? *Agama atricollis* Calabresi, 1927, Atti Soc. Ital. Sci. Nat., 66, p. 27.

? *Agama cyanogaster* Scortecci, 1931, Atti Soc. Ital. Sci. Nat., 70, p. 142.

juv. ♂ Borama District, 4000 ft., 42°25'E x 10°20'N.

A. annectans was originally described from the Suru (or Sooroo) Pass in Eritrea (circa 39°32'E x 15°05'N), but has not since been recorded from that region, though it has been reported from Harar, 1900 meters, and the Fulla Valley, 500 meters (Tornier, 1905; Neu-

mann, 1905), various localities in southeastern Ethiopia and in the eastern parts of British Somaliland (Sol Haud, Buran District, Al Mado Mts. and Las Elan; Parker, 1932). It does not appear to range into the Haud and has not been reported from the Ogaden or countries to the south and east.

6. *AGAMA RUEPELLI RUEPELLI* Vaillant

Agama rueppelli Vaillant, 1882, in Revoil, Mission Pays Çomalis, Rept. p. 6, pl. i.

Agama vaillanti Boulenger, 1895, Ann. Mus. Genova, (2), 15, p. 12, pl. iii, fig. 1.
Agama rueppelli rueppelli Parker, 1932, Journ. Linn. Soc. London, Zool. 38, p. 224.

4 ♂♂, 5 ♀♀, 2 juvs. from various localities along the boundary westwards and northwards from 43°15'E to 42°40'E and 9°55'N to 10°45'N at altitudes of 2000 to 5000 ft.

This series is homogeneous and typical. The species appears to be widely distributed along the maritime plain and adjacent mountains through British Somaliland and to extend southwards through the eastern districts of the Sol Haud, Nogal Valley and eastern Haud to the Ogaden, Italian Somaliland and Kenya Colony. Its place appears to be taken in the central Haud by a smaller, allied species which has not yet received a name.

7. *AGAMA PERSIMILIS* spec. nov.

Holotype a female, number 1937. 12. 5. 64 in the British Museum, from 45°50'E x 8°N in the Haud; collected by Capt. R.H.R. Taylor on November 25th, 1934.

Head convex, the upper surface of the snout flat; nostril tubular, directed upwards and backwards in the posterior part of the nasal above the canthus rostralis. Upper head scales moderately large, those on the supraocular region longitudinally elongate, with a blunt keel; occipital scale enlarged; ear superficial, completely exposed, its diameter equal to that of the eye-opening; lower and posterior borders of the ear and sides of the neck with tufts of spines, the longest of which is about half the length of the eye-opening; these tufts of spines do not encroach upon the ear-opening. Two transverse gular folds, but no pouch. Body strongly depressed, with large, homogeneous, imbricate, keeled and mucronate scales, convergent towards the middle line except on the nuchal and occipital regions where they are reversed and point forwards; about 30 scales on the vertebral line between the anterior

limits of the insertions of the fore and hind limbs; 57 scales round the middle of the body; 9 scales of an oblique series corresponding to a length equal to that from the tip of the snout to the anterior border of the ear. Tip of the fourth toe reaching the posterior corner of the eye; third finger a little longer than the fourth, and the fourth toe slightly longer than the third; tibia as long as the skull. Tail 2.4 times as long as the distance between the posterior gular fold and the vent, depressed and tapering very abruptly in its proximal sixth, slender and cylindrical posteriorly. Ventral scales smooth, much smaller than the dorsals. General colour rufus brown, with a strongly-marked geometrical colour-pattern. Upper surface of the snout to the level of the anterior borders of the eyes pink; a broad brown bar, the full width of the supra-ocular region, across the head with an oblique extension from its posterior corners towards the ears; an oblique brown bar from beneath the eye to the anterior border of the ear; occiput pink mesially and a longitudinal stripe of the same colour extends down the midline of the back onto the tail; an oval dark brown spot on each side of the nape; three transversely elongate brown diamond-shaped blotches on the back, decreasing in size caudally, the last on the sacral region, each edged by a narrow light line and bisected by the mid-dorsal light line. An elongate, triangular, dorso-lateral brown blotch on each side runs from the shoulder to the middle of the flank where its apex is narrowly separated from the apex of a similar blotch which extends backwards to the groin; flanks beneath these two markings occupied by a single large, triangular, brown blotch, the 3 lateral and dorso-lateral markings being all more or less distinctly edged with lighter. Tail with transverse dark bars, bisected mid-dorsally. Limbs with dark brown, light-edged markings. Lower surfaces uniform white.

Length from snout to vent 56 mm. Tail 95 mm. The following specimens, all collected by Capt. Taylor are the paratypes:

4♂♂, 5♀♀, 1 juv. from near Bohodle ($46^{\circ}20'E \times 8^{\circ}15'N$, 2100 ft.) collected between Jan. 21st and April 1st 1932.

1♀ collected at the same time and place as the holotype.

1 gravid female from $46^{\circ}09'E \times 8^{\circ}17'N$, 2200 ft., taken on Aug. 21st, 1932.

1 juvenile from $45^{\circ}09'E \times 8^{\circ}37'N$, 3050 ft., taken on July 9th, 1932.

This series of specimens, collected in the central Haud, is very homogeneous. There are some variations in scale size, the number of scales on the mid-dorsal line varying from 26-31 and the number in an oblique series corresponding to a length equal to that between the tip of the snout and the ear, from 8-11. Adult males vary in size from

43 to 54 mm. and females from 56 to 64 mm.; in a series of twenty-three *rueppelli rueppelli* males measure from 58 to 88 mm. and females from 76 to 88 mm. The species is undoubtedly very closely allied to *Agama rueppelli rueppelli* Vaillant, which was not found in the central Haud, though common in the coastal mountains and in the countries to the east and south of the area occupied by *persimilis*. The two may be distinguished readily by the characters mentioned in the accompanying key.

8. AGAMA (XENAGAMA) BATILLIFERA (Vaillant)

Uromastix batilliferus Vaillant, 1882, in Revoil, Mission Pays Comalis, Rept., p. 10, pl. ii.

12 ♂♂, 11 ♀♀, 4 juvs. from the mountains of the Ogo between 43°10' and 43°30'E and 9°30' and 9°50'N at altitudes of 4500 to 5300 ft.

This species is chiefly nocturnal in its habits, being found by day in burrows which it constructs in soft earth. The tunnels are just wide enough to permit the animal's passage, are 2 to 3 feet long and reach a depth of about a foot; there does not appear to be any definite terminal chamber or nest. The species seems to be confined to the mountains bordering the Haud on the north from 43°10' to 50°27'E (Vaillant, 1882) and to extend into the Ogaden on its western side as far as Sasabanch (Boulenger 1895c). Within this area there may prove to be some geographic variation for the present series from the extreme west of the range of the species have a slightly narrower, less distinctly discoid tail than others from the east (10°25'N, 47°12'E). To the south, in the Haud, *A. batillifera* is replaced by

9. AGAMA (XENAGAMA) TAYLORI Parker

Aporoscelis batilliferus (non Vaillant) Peel, 1900, Somaliland (London), pp. 175, 176, 334, fig.

Agama (Xenagama) taylori Parker, 1935, Ann. Mag. Nat. Hist. (10), 16, p. 525.

♂, ♀ from the Haud at 3400-3500 ft., near 44°49'E x 8°43'N.

These two examples are the only ones known to exist in Museums, but the specimen described and figured by Peel almost certainly belongs to this form, which differs from the typical montane *A. batillifera* in its broader, more discoid tail. At first it was thought to represent a distinct species, but, as pointed out above, *A. batillifera* shows some geographical variation in this respect which suggests the possibility that *A. taylori* may ultimately prove to be only racially distinct. At

the present moment, however, no intermediates have been found and the degree of difference between it and any specimen of *A. batillifera* is far greater than has been recorded in the latter species over a much wider geographical area. Peel's specimens were seen in the Haud at Bally Maroli, a short distance south-east of Odaweina.

Uromastix

- I. Tail only slightly shorter than the head and body; a series of preanal and femoral pores. *U. macfadyeni*
 II. Tail only half the length of the head and body; no femoral or preanal pores. *U. princeps*.

1. UROMASTIX MACFADYENI Parker

Uromastix macfadyeni Parker, 1932, Proc. Zool. Soc. London, p. 353.

U. ocellatus (non Licht.) Tornier, 1905, Zool. Jahrb., Syst., 22, 4, p. 372.

4 ♂♂, 3 ♀♀, 7 juvs. from the Guban between 10° and 11°15'N and 42°40' and 43°15'E, at altitudes of from 1000-3800 ft.

The relationships of this species to various other members of the genus *Uromastix* have already been discussed in the original description, but its nearest relative appears to be the southern Arabian *Uromastix (Aporoscelis) bentii*. It appears to be so closely allied to this species that the retention of *Aporoscelis*, even subgenerically, does not seem to be justified.

It is a herbivorous lizard usually found hiding in burrows by day and seems to be confined to the foot hills of the Guban as far east as Dagah Shabell, 24 miles S.E. of Berbera.

2. UROMASTIX PRINCEPS O'Shaughnessy

Uromastix princeps O'Shaughnessy, 1880, Proc. Zool. Soc. London, p. 445, pl. xliii.

Aporoscelis princeps Boulenger, 1885, Cat. Lizards Brit. Mus., 1, p. 410.

A diurnal, terrestrial species, partly herbivorous, partly insectivorous, which frequents the rocky and stony districts of the extreme north-east corner of the Somali Peninsula; in the British Protectorate it has only been recorded from the eastern boundary, from the coastal plain to the Nogal Valley (Parker, 1932, p. 351). The doubtful records of the species from Zanzibar (O'Shaughnessy *loc. cit. supra*), Aden (Vaillant, p. 10) and Asmara (Scortecci, 1933, p. 1) are probably to be ascribed to specimens either wrongly labelled or transported in coastal vessels.

VARANIDAE

Varanus

- I. Nostril three times as far distant from the tip of the snout as from the eye; dorsal scales very large, especially on the neck. . . .
 *V. ocellatus*
- II. Nostril a little nearer the eye than the end of the snout; dorsal scales small, not appreciably enlarged on the nape. . . . *V. niloticus*

1. VARANUS OCELLATUS Rüppell

Varanus ocellatus Rüppell, 1827, Reise N. Afr., Rept. p. 21, pl. vi.

Varanus albigularis Boettger, 1893, Zool. Anz., p. 115.

3 skins from the Haud 42°40'–44°24'E x 10°30'–8°52'N, 3500–4800 ft.

Schmidt (Bull. Amer. Mus., 1919, 39, p. 483) has called attention to the fact that Meek's record (1897, p. 181) of *Varanus albigularis* is really based on a specimen of *V. ocellatus* and it seems very possible that other Somali records of the white-throated monitor are due to similar misidentifications. The two species are very similar and at the present time it seems almost impossible to delimit accurately the ranges of the two; *ocellatus* certainly ranges over the whole of the Somali Peninsula and the Sudan, southwards into Kenya Colony and Tanganyika Territory.

2. VARANUS NILOTICUS (Linn.)

Lacerta nilotica Linnaeus, 1766, Syst. Naturae, (12), p. 369.

There is no record of the Nile monitor from British Somaliland, though it has been reported from the Ogaden. Since it is a species seldom found far from a permanent water-supply, it is more than likely that it does not occur in the protectorate.

AMPHISBAENIDAE

Agamodon

- I. Annuli on the body 133–137; on the tail 15–19; 0–6 preanal pores
 *A. anguliceps*
- II. Annuli on the body 143–160; on the tail 18–23; preanal pores 0–2
 *A. compressum*

Neither of these species has yet been reported from the British Protectorate though both are not uncommon in southern Italian Soma-

liland. Since burrowing species, such as these, are liable to be overlooked very easily, it is conceivable that they may yet be discovered; but the difference in the humidity of the soil in the Shebeli and Juba regions, as compared with British Somaliland, suggests that if the genus really does occur in the latter area it will be represented by a distinct species.

ANCYLOCRANIUM genus nov.

Type species *Anops somalicus* Scortecci, 1930, Boll. Mus. Tornio, **41**, 3, p. 6., figs. 1-5.

Stejneger (1916, p. 85) has drawn attention to the fact that *Anops* Bell 1833 (type species *A. kingi*) is preoccupied by *Anops* Oken 1815, and proposed *Anopsibaena* as a substitute generic name for the South American lizard *A. kingi*. The only other species which at that time was commonly referred to *Anops* Bell, was a West African lizard originally described by Gray in 1865 as *Baikia africana*. On purely geographical grounds Stejneger was convinced that *africana* and *kingi* could not be congeneric so that the name *Baikia* was available only for the African species. With the discovery of *somalica* there are now three known species of the "*Anops*" type and examination of their skulls confirms Stejneger's contention and also suggests that the third species represents yet another evolutionary line. These three may be distinguished thus:

- I. The whole skull laterally compressed with a median crest extending from the premaxilla to the occiput; premaxilla extending backwards, separating the nasals completely and the frontals anteriorly; extra-columella not dilated anteriorly (fig. 7b). *Anopsibaena*.
- II. The skull compressed anteriorly only, the median ridge extending from the premaxilla to the parietal only, the upper surface of the latter being quite flat; premaxilla small, the nasals forming a median suture; extra-columella not dilated anteriorly (fig. 7c) *Baikia*
- III. The skull compressed anteriorly only the parietal being flat above; nasals forming a median suture; compressed anterior elements of the skull forming a high crest which extends backwards over the parietal region as a pronounced hook; extra-columella dilated anteriorly to form a large, thickened pad attached to the lower labial (fig. 7a) *Ancylocranium*

These differences may be appreciated by a comparison of the accompanying figures, but some explanation is necessary with regard to

the extra-columella. A feature of all three genera, and probably of the majority of *Amphisbaenids* is the peculiar condition of the ear (Versluys, 1898, p. 82). There is no tympanum, the merest rudiment of a

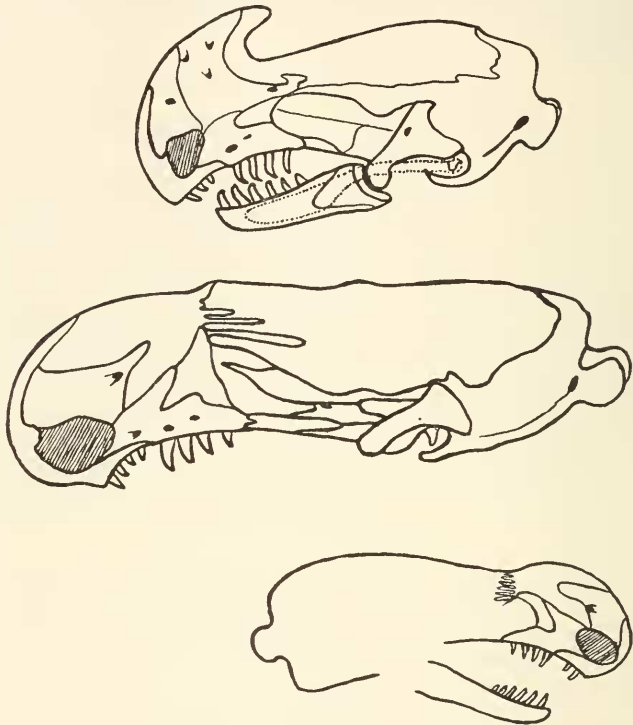


Fig. 7. Skulls of the three species formerly referred to the Amphisbaenid genus *Anops* Bell.

- a. *Ancylocranium somalicum* (Scortecci). Somaliland. Extra-columella indicated by dotted outline.
- b. *Anopsibaena kingi*. South America.
- c. *Baikia africana* (Gray). West Africa.

Type and only known specimen; outline from X-ray photograph; sutures anteriorly determined by dissection.

cavum tympanum and no eustachian tube; the columella auris is short, and owing to the forward rotation of the lower end of the quadrate the fenestra ovalis lies ventral to, rather than behind, this

bone. Attached to the outer end of the columella is a long cartilaginous rod, the extra-columella; this rod runs forwards over the outer surface of the quadrate and along a groove on the ventro-lateral surface of the mandible and is attached anteriorly by fibrous ligaments to the corium of the lower labials. In *Ancylocranium* the anterior end of this extra-columellar rod is expanded to form a large thickened pad underlying and attached to the whole length of the enlarged second lower labial. It seems probable that this modification permits the ear to function more effectively in detecting vibrations in the soil with which the chin is normally in contact.

ANCYLOCRANIUM SOMALICUM (Scortecci)

Anops somalicus Scortecci, 1930, Boll. Mus. Torino, **41**, p. 6, figs. 1-5.

Baikia somalica Loveridge, 1941, Bull. Mus. Comp. Zoöl., **87**, p. 370, fig. 6.

Ad. Haud, 2100 ft. 46°E x 8°20'N, 29. iv. 32.

Ad. Haud, 2300 ft. 45°58'E x 8°24'N, 5. v. 32.

Ad. Haud, 2350 ft. 45°43'E x 8°26'N, 18. v. 32.

These specimens show some slight variation beyond that already described for the species. The segments in an annulus vary from 30/21 to 32/23 (vice 27/22, 28/24), there are from 186 to 193 annuli on the body (197-199) and from 7 to 8 on the tail (vice 6-7). Thus these three examples from the Haud differ appreciably from the only other known examples of the species, the types from Caitoi on the Webi Shebeli. It is not improbable that the differences are really indicative of racial differentiation but far too little is at present known of the stability or variability of these lizards for it to be possible to form any definite opinion on the point.

LACERTIDAE

Eremias

- I. Upper head-scales smooth or only slightly rugose; dorsal scales smooth or feebly keeled, never tricarinate.
- A. No granules between the supra-oculars and the frontals and fronto-parietals. Usually three nasals. *E. guttulata olivieri*
- B. A ring of granules bordering the supra-oculars. Usually four nasals.
 1. Dorsal scales smooth. Dorsal pattern of 5 stripes of which the two laterals on each side may be broken up.

- a. Posterior subcaudals smooth; ventrals in 6 longitudinal series with traces of an additional row on each side; subocular usually entering the lip. *E. mueronata*
 - b. Posterior subcaudals keeled; ventrals in 8 longitudinal series with traces of an additional row on each side; subocular excluded from the upper lip. *E. smithi*
 2. Dorsal scales smooth or keeled; posterior subcaudals smooth or keeled; dorsal pattern of 7 stripes, none broken up. Subocular entering the lip. *E. septemstriata* sp. n.
 3. Dorsal scales keeled; posterior subcaudals keeled; dorsal pattern of irregular spots; subocular excluded from the lip. *E. erythrostickta*
- II. Upper head scales rugose or strongly striated; dorsal scales usually tricarinate.
- A. Snout long; toes unicarinate or with additional keels much smaller than the median.
 1. Fronto-nasal distinctly longer than broad; femoral pores 17-25; three or four nasals; head shields finely or strongly striated; subocular excluded from the lip; a pattern of 5 dark longitudinal stripes of which at least the outermost encloses rows of circular white spots. *E. brenneri*
 2. Fronto-nasal a little broader than long; femoral pores 13-17; four, rarely three, nasals; head shields rugose; subocular usually entering the lip; 5 dark longitudinal stripes without any trace of light spots. *E. striata*
 - B. Snout short, the fronto-nasal much broader than long; three nasals; toes bicarinate; five or seven dark stripes bearing rows of black blotches; subocular excluded from the lip. *E. spekkii sextaeniata*

EREMIAS GUTTULATA OLIVIERI (Audouin)

Lacerta olivieri (part) Audouin, 1829, Descr. d'Egypte, Rept. Supp., p. 175, pl. ii, fig. 2.

Eremias guttulata Tornier, 1905, Zool. Jahrb. Syst., 23, p. 379.

Eremias guttulata martini Neumann, 1905, Zool. Jahrb. Syst., 23, p. 396.

14 ♂♂, 6 ♀♀, 1 juv. from various localities on the boundary between 42°40' and 43°15'E x 10°20' and 11°25'N, at altitudes of from 0-3500 ft.

Criticism has already been levelled at the varieties of *Eremias guttulata* recognized by Boulenger (1921), many of which occur to-

gether in the same localities and so do not appear to be true subspecies. On geographical grounds the form occurring in Somaliland should be *martini*, but in the foregoing series, whilst some individuals have the striped colour of *martini*, others are not distinguishable from the typical form of *olivieri*, and the morphological characters are those of the latter; there are 4 to 7 enlarged plates in the lower eyelid, 37 to 46 scales across the middle of the back and 9 to 14 femoral pores. Until the whole species can be satisfactorily revised, it is difficult to know how to treat the various "races." Flower has pointed out (1933, p. 798) that the *forma typica* is the normal form in Egypt but that specimens referable to *martini* and *olivieri* occur as individual variations, and it seems possible that the apparent overlapping of the races is due to the prevalence of similar individual variants in populations composed for the most part of a different form; *martini* is probably not to be distinguished from *olivieri*.

Like other northern species it only enters Somaliland in the coastal zone north of the mountains whose northern slopes it ascends to an altitude of 3500 ft.

EREMIAS MUCRONATA (Blanford)

Acanthodactylus mucronatus Blanford, 1870, Obs. Geol. and Zool. Abyssinia, p. 453, fig.

Eremias lugubris (non Smith) Vaillant, 1882, Mission Révoil Pays Çomalis, Rept. p. 23.

Eremias breunneri (non Peters) Meek, 1897, Field Columbian Mus., Zool. Series, 1, 8, Publ. 22, p. 181.

26 ♂♂, 14 ♀♀ Borama Distr., 5000 ft., 42°45'E x 10°20'N, 19-24.2.33.
♂, 150 ft., 43°15'E x 11°25'N, 14.1.34.

This series is very constant in morphological characters and in colour. Only one specimen, a male, is in any way abnormal, and there the small post-nasal is fused with the supra-nasal so that there are only three shields surrounding the nostril. The scales across the back vary from 61 to 78, ventrals are in 6 or 8 longitudinal series, the outermost always being small, and the femoral pores vary from 17 to 24. The colour is of the normal type with an unbroken median dorsal stripe, flanked with white and primitively with two broad, dark lateral stripes enclosing numerous small, circular white spots; this pattern occurs in juveniles and persists to a greater or less extent in adult females, but in males the white spots are so numerous that almost all trace of the lateral stripes is lost.

The species is a northern form which extends along the mountain chain of the north of the country and in the coastal zone. It has not yet been recorded from the region south of the mountains in British Somaliland but occurs in the Ogaden (Boettger, 1893; Boulenger, 1895, 1896) and the Sultanate of Obbia (Calabresi, 1927).

EREMIAS SMITHI Boulenger

Eremias smithi Boulenger, 1895, Proc. Zool. Soc. London, p. 534, pl. xxix, fig. 4.

3 ♂ ♂, 5 ♀ ♀ Burao, 3500 ft.

8 ♂ ♂, 11 ♀ ♀ from the mountains around Borama, 4500-5300 ft.

This series shows little variation beyond that already described for the species (Boulenger, 1921, p. 247) except that there may be as few as 61 scales across the body and only 16 femoral pores; there are never less than 8 rows of ventrals and frequently indications of an additional series on each side are present.

The species appears to range from the coastal plain through the mountains and the Ogaden southwards to Kenya Colony.

EREMIAS SEPTEMSTRIATA spec. nov.

Eremias striata (non Peters) Parker, 1932, Proc. Zool. Soc. London, p. 354.

Holotype a male, number 1931. 7. 20. 300 from the Halin district, Somaliland (9°7'N x 48°38'E) at 2000 ft., collected 14. III. 30 by Capt. R. H. R. Taylor.

The specimens mentioned in the above reference were noted to deviate from the normal of *striata*, and the additional comparative material of that species now available makes it appear more probable that they represent a distinct form which is in many ways intermediate between *brenneri* and *striata*, but differs from either in its smooth or only feebly striated head shields and dorsal scales and in the distinctive colour pattern.

Head shields smooth or very feebly rugose, disposed and proportioned as in *E. brenneri*, except that the subocular, though narrowed inferiorly, broadly enters the lip; snout long, with a fronto-nasal slightly longer than broad; constantly 4 nasals. Dorsal and lateral scales juxtaposed, smooth or feebly uncarinate, in 54 to 68 series across the middle of the body; ventrals in 8 longitudinal series; enlarged brachials and subcaudals smooth or keeled in conformity with the dorsals. Femoral pores 15-20.

Colour white or pale brown with 7 dark brown longitudinal stripes arranged as follows: A broad lateral band from the subocular through the upper part of the ear and above the limbs, extending on to the tail, and usually enclosing a single row of small circular, white spots; a dorso-lateral stripe, similar in width, extends from the posterior corner of the eye, but does not extend on to the tail and may, or may not, have a row of white spots included in it; three narrower dorsal stripes, of which the median alone extends on to the tail, the two outer varying in length, being as a rule shortest in juveniles where they may not extend backwards beyond the nape; there may also be traces of an indistinct dark, ventro-lateral stripe between the fore- and hind-limbs; lower surfaces uniform white; limbs brown, with numerous large, circular white spots.

Length from snout to vent	42 mm.
Tail (partly regenerated)	107 mm.
Fore-limb	16 mm.
Hind-limb	35 mm.

The paratypes are:

1931.7.20.301	♂	3300 ft.	Buran Distr.	(10°13'N x 48°46'E)	7.i.30.
1931.7.20.298	♀	2000 ft.	Haud	(8°N x 48°E)	2.v.30.
1931.7.20.299	♀	1900 ft.		(8°54'N x 48°54'E)	17.iii.30.
1931.7.20.306	♀	2375 ft.	Buran Valley	(10°21'N x 49°E)	2.x.29.
1931.7.20.302-305	4 juvs.	2600 ft.	Buran Valley	(10°16'N x 48°55'E)	29.xi.29.

The largest female measures 50 mm. from snout to vent, with an unregenerated tail of 125 mm., a fore-limb of 17 mm. and a hind-limb of 37 mm.

As indicated above, this species is allied to *E. striata* but also shows affinities with the northern, smooth-scaled species such as *E. mucronata* and *E. smithi*.

EREMIAS ERYTHROSTICTA Boulenger

Eremias erythrostickta Boulenger, 1891; Ann. Mus. Genova, (2), **12**, p. 10, pl. i, fig. 2.

This species was not collected by Capt. Taylor, but is probably an inhabitant of the eastern part of the country south of the maritime mountains. It was originally described from specimens collected "between Obbia and Berbera" and has since (Calabresi, 1927) been recorded from Obbia, the dunes between Obbia and Sissib and the Nogal Valley.

EREMIAS BRENNERI Peters

Eremias brenneri Peters, 1869, Mon. Ak. Berlin, p. 432.

Eremias edwardsi Mocquard, 1888, Mém. Cent. Soc. Philom. Paris, p. 115, pl. xi, fig. 1.

2 ♂ ♂ Burao, 3500 ft.

♂, ♀ Ado (45°15'E x 7°20'N) 2100 ft.

♂ Milmil (43°40'E x 8°10'N) 3000 ft.

10 ♂ ♂, 12 ♀ ♀ Haud (46°20'E x 8°15'N and 44°54' x 8°42'N) 2100 and 3300 ft.

This series shows some slight variations beyond those already recorded. The dorsal scales which are always strongly keeled and often tricarinate, vary from 58 to 72 and the femoral pores from 17 to 25. It is most surprising, however, to find that in 11 of the 27 species there are only three nasals, the lower being undivided, and in two others the condition is asymmetrical and intermediate with three on one side, and four on the other. A similar variation in the number of nasals, which completely links the subgenera *Lamperemias* and *Pseuderemias* also occurs in *E. striata* and has been recorded in *Eremias nitida quadrinasalis* Chabanaud, by Loveridge (1937, p. 283). Another interesting feature of the series is that yet again, there is a marked tendency towards erythrism in specimens from the Haud, though it is by no means as clearly marked as, for instance, in the genus *Latastia*. In the specimen showing the condition most markedly the whole of the dorsum is brick-red, with white stripes and longitudinal rows of round white spots, but without any trace of the usual darker stripes.

The species appears to have a range from the mountains south of Berbera through the Ogaden and Italian Somaliland as far south as Brava; the record from the Tana River (Stejneger, 1893) has been shown by Loveridge (1929, p. 65) to be based on an example of *E. smithi*.

EREMIAS STRIATA Peters

Eremias brenneri var. *striatus* Peters, 1874, Mon. Ak. Berlin, p. 370.

3 ♂ ♂, 2 ♀ ♀ Haud, 46°20'E x 8°15'N, 2100 ft.

♂, 8 ♀ ♀ Haud, 44°54'E x 8°42'N, 3300 ft.

This species which has a geographical range not unlike that of the preceding, is closely allied to it and not easily distinguishable. The foregoing series makes it evident that the condition of the subocular, whether entering or excluded from the labial margin, is by no means a constant or satisfactory character, since it is excluded in 4 specimens

though entering in the remainder. The nasal condition, too, resembles that of *brenneri* for though there are usually four shields surrounding the nostril, one specimen has only three and another is asymmetrical with 4 on one side and three on the other. These facts would seem to indicate that *striata* cannot be maintained as a distinct species, but there are certain differences utilised in the accompanying "key" (p. 59) which have not yet been shown to be invalid and a conservative attitude has been adopted until more definite evidence is forthcoming.

EREMIAS SPEKII SEXTAENIATA Stejneger

Eremias sextaeniata Stejneger, 1894, Proc. U.S. Nat. Mus., **16**, p. 718.

Eremias spekii sextaeniata Tornier, 1905, Zool. Jahrb., Syst., **22**, p. 377.

Eremias spekii Scortecci, 1931, Atti Soc. Ital. Nat. Sci., **70**, p. 145.

3 ♂ ♂, 4 ♀ ♀ Haud at various localities between 46° and 46°25'E x 8°15' and 8°30'N at altitudes of from 2100-2400 ft.

2 ♀ ♀ Borama 43°05'E x 9°55'N, 4500 ft.

3 ♂ ♂, 3 ♀ ♀ Dakhato River 42°25'E x 9°10'N, 4700 ft.

♂ Daghabur 43°30'E x 8°13'N, 3500 ft.

This series collected at very different altitudes and in different types of country shows some local variations, of which the most pronounced is found in the Haud. Here, in sandy country, at altitudes of less than 2500 feet, the scales are relatively larger, in 55 to 64 series at the middle of the body, and in other examples from the eastern Haud and Nogal Valley (Parker, 1932) the same condition is found. But in those from the rocky uplands, inland of Berbera, around Borama, Daghabur and Harrar, the scales are very much smaller and arranged in from 63 to 73 series. This difference is insufficient to warrant the nomenclatorial recognition of a distinct race since examples of *sextaeniata* from northern Kenya show a range of variation in the same character from 59 to 75; but it serves to emphasise, once again, the tendency towards differentiation which is to be found in the animals of the Haud.

E. spekii sextaeniata is considered by Loveridge (1937, pp. 493 and 495) to be a form of the coastal plain and upland Savannahs in Kenya, but its geographical range from the Gulf of Aden to northern Kenya westwards into the Abyssinian highlands is typical of his Zone 4, the Northern Desert.

Latastia

The various subspecies, which grade into one another, cannot conveniently be treated in key-form so that they have not been considered in this synopsis but are dealt with under specific headings.

- I. Usually a group of small irregular scales in the middle of the pectoral region interrupting the regular linear arrangement of the ventral plates.
 - A. Dorsal scales not larger than the laterals, smooth, tectiform or keeled *L. longicaudata*
 - B. Dorsal scales larger than the laterals, strongly keeled. *L. carinata*
- II. No group of small scales in the centre of the chest which is covered by regularly arranged plates similar to those on the belly.
 - A. Frontal with a median groove; dorsal scales keeled or tectiform. *L. boscai*
 - B. Frontal without median groove; dorsal scales smooth and flat. *L. taylori* sp. nov.

LATASTIA LONGICAUDATA REUSS

(fig. 3)

Lacerta longicaudata Reuss, 1834, Ber. Mus. Senck., **1**, p. 29.

Lacerta samharica Blandford, 1870, Geology and Zoology Abyss., p. 449, fig.

Eremias revoili Vaillant, 1882, Miss. Révoil, Pays Çomalis, Rept., p. 20 pl. iii, fig. 2.

Latastia doriai Bedriaga, 1884, Ann. Mus. Genova, **20**, p. 313.

Latastia caeruleopunctata Parker, 1935, Ann. Mag. Nat. Hist., (10), **16**, p. 527.

This species is notoriously very variable, but a survey of the material brought back by Capt. Taylor from all the boundaries of British Somaliland does suggest that the variations are, to a large extent, correlated with geographical distribution, and that many races can be recognised. But whether or not all these can be named satisfactorily is another matter, and, for the moment, it is only proposed to use names which are already in existence.

In the coastal zone both in the east and west, at altitudes up to 3500 feet, there exists a race characterised by smooth dorsal granules, 11 to 14 femoral pores and a colour pattern based on the following scheme:

Dorsum brown with 5 longitudinal series of small black or dark brown spots which tend to fuse longitudinally, more especially the

mid-dorsal series; a broad dark brown dorso-lateral stripe or series of spots from the ear to the tail, above the limbs, which may include a series of blue ocelli; flanks below this with one or two more longitudinal series of spots; the outermost dorsal, the dorso-lateral and lateral series show a strong tendency to form transverse (vertical) bars which in juveniles may be very pronounced and intensified by black lines. This is generally regarded as the typical form of the species (type locality Tor, Sinai) though there are some differences between specimens from the west (Guban) and the east. The latter have 8 longitudinal series of ventrals, although the outermost series on each side is small and rounded, and there are very numerous small scales in the centre of the pectoral region whereas in those from the Guban the pectorals are scarcely differentiated and there are only 6 rows of ventrals with, sometimes, traces of another row on each side.

On the eastern boundary of the country immediately to the south of the Al Mado Mountains in the "Buran District" (Taylor in Parker, 1932, p. 335) is a form essentially similar to the preceding in its dorsal pholidosis and colouring, but with 8 rows of ventrals, the outermost large and rectangular, and 6-9 femoral pores. The area from which these specimens came is in the general region of the type-locality of *Latastia revoili* (Vaillant, 1882) and they agree very closely with the description of that species. Immediately to the south of this zone, in the region of the Sol Haud, Nogal Valley and the eastern Haud, there is a tendency for the outermost ventral series to be reduced and the dorsals to become tectiform.

An analogous, but slightly different, form occurs to the south of the typical subspecies in the western boundary in the Ogo at altitudes of from 3500 to 5000 feet. The dorsal scales and colouring are essentially similar, though the latter is much more intense and defined, but the femoral pores are fewer in number, varying from 4 to 7, 5 and 6 being the commonest. If this montane race can be distinguished from *revoili* the name *doriai* Bedriaga (cotype examined) may be available. It should be pointed out that at altitudes of about 3500 ft. where the mountains drop down to the coastal plain both *doriai* and the typical form were taken side by side, but that, among a series of 12 of the former and 7 of the latter, there were no intermediates, there being a gap in the number of femoral pores between 7 and 10.

Between *revoili* on the east and *doriai* on the west, there occurs in the Haud at altitudes of from 2100 to 3500 ft. a very differently coloured race which also has some slight morphological differences. The dorsal scales are more or less distinctly keeled, there are only six ventral

series, and femoral pores vary from 6 to 10. In these characters there seems to be complete intergradation with *revoili* but the most characteristic difference is in the colour. The dorsum is bright, brick red with 4 longitudinal series of small pale blue or whitish spots which may also form transverse rows or be arranged quincuncially; rarely in juveniles, there may be transverse black lines between the blue spots. On the flanks are two or three longitudinal series of larger, darker blue ocelli which may fuse to form bands; more usually, however, there are transverse black lines between the ocelli which fuse to form vertical dark bars. This is the recently described *caerulcopunctatus* Parker, and it appears to be confined to the northern and western Haud; Neumann's (1905, p. 393) record of a red specimen from Modjo (Western Ogaden) might be based on this form, and not, as Boulenger suggests (1921, p. 28) on an erythristic individual. In the original description of *caerulcopunctata* it was stated that it occurred side by side with *longicaudata* and so the two could not be regarded as subspecies. This statement was incorrect and it is now found that all specimens collected in the area indicated are of the red form but there is somewhat more variability in colour pattern than was originally described.

The distribution of the various races along the boundaries and adjacent territories of British Somaliland and the material examined is as follows:

1. LATASTIA LONGICAUDATA LONGICAUDATA (Reuss)

♂	11°9'N x 49°E	200 ft.	26.XI.23
♀	11°5'N x 49°E	600 ft.	23.XI.29
juv.	Between Hargeisa & Borama		X.32
♂	10°N x 43°E	1300 ft.	15.VI.34
♀	10°30'N x 42°40'E	3500 ft.	22.III.33
2 ♂ ♂, ♀	10°30'N x 42°45'E	3500 ft.	28.V-6.VII.33
juv., ♀	11°N x 43°E	1500 ft.	19.XII.33
♂	11°15'N x 43°15'E	500 ft.	28.I.34

2. LATASTIA LONGICAUDATA REVOILI (Vaillant)

2 ♂ ♂, 5 ♀ ♀	10°5'-10°50'N x 49°E	2375-3300 ft.
♂	9°14'N x 48°30'E	2200 ft.
6 ♂ ♂, 5 ♀ ♀	8°20'-9°N x 48°5'-48°43'E	1400-1800 ft.
3 ♂ ♂, 3 ♀ ♀	8°-8°10' N x 48°-48°10'E	2000-2500 ft.

3. *LATASTIA LONGICAUDATA DORIAI* (Bedriaga)

♀	9°50'N x 43°20'E	5000 ft.	22.XII.32
2 ♂ ♂, ♀, juv. ♂	9°50'N x 43°10'E	5000 ft.	{ 24XII.32 8-12.V.33 5.VI.33
♂, ♀	9°55'N x 43°10'E	4500 ft.	27.VIII.-2.IX.34
♂, ♀	9°55'N x 43°05'E	4500 ft.	26.I.33
♀	10°N x 43°E	4500 ft.	2.X.33
♀	10°20'N x 42°50'E	3500 ft.	29.VII.33
♀	10°30'N x 42°40'E	3500 ft.	25..III.33

4. *LATASTIA LONGICAUDATA CAERULEOPUNCTATA* (Parker)

♂	8°30'N x 46°25'E	2400 ft.	18.II.32
5 ♂ ♂, 10 ♀ ♀	8°15'N x 46°20'E	2100 ft.	{ 26.I.32 30.III.32
♀	8°N x 45°50'E	2500 ft.	26.XI.34
2 juvs.	8°34'N x 45°18'E	2900 ft.	17.VI.32
6 ♂ ♂, ♀	7°20'N x 45°15'E	2100 ft.	23.XI.34
♂, ♀	8°37'N x 45°09'E	3050 ft.	26.VI.32
3 ♂ ♂, 2 ♀ ♀	8°42'N x 44°54'E	3300 ft.	12.XII.34
♀	8°24'N x 44°E	3500 ft.	20.XII.34
2 ♂ ♂, 2 ♀ ♀	8°10'N x 43°40'E	3000 ft.	20.XII.34
♀	8°13'N x 43°30'E	3500 ft.	24.XII.34
2 ♀ ♀, 2 juvs.	Bohodle	2100 ft.	12.III.32

LATASTIA CARINATA (Peters)

Lacerta carinata Peters, 1874, Mon. Ak. Berlin, p. 368, pl. fig. 1.

? *Latastia ventralis* Werner, 1917, Mitt. Zool. Mus. Hamburg, 34, p. 32.

This species, originally described from a single specimen from Brava, Italian Somaliland, has since been recorded from the type-locality and from Berbera (Boulenger, 1921, p. 32), from the Danakil depression near Zeila, and from near Jaldessa (Tornier, 1905 and Neumann, 1905). *Latastia ventralis* based on a single specimen obtained by Hildebrandt, who also collected the type of *carinata*, is possibly a synonym.

LATASTIA BOSCAI Bedriaga

(fig. 4)

Latastia boscai Bedriaga, 1884, Ann. Mus. Genova, 20, p. 322.

Latastia burii Boulenger, 1907, Ann. Mag. Nat. Hist. (7), 19, p. 393.

Latastia wachei Werner, 1913, Jahrb. Hamb. Wiss. Anst., 30, p. 16.

Boulenger, (1921, p. 22) and the author (1932, p. 355) in discussing this species have referred to two very different colour-phases; but there appears to have been confusion of at least two distinct forms, one of which probably represents a distinct species (see *Latastia taylori* sp.n.). The larger series now available throws considerable light on the problem and also on the status of *Latastia wachei* Werner and *Latastia burii* Boulenger. The whole of the material can be subdivided into the following groups:

1. LATASTIA BOSCAI BOSCAI Bedriaga

3 ♂ ♂, 2 ♀ ♀	43°25'E x 9°50'N	5000 ft.	5.xi.32-16.i.33
♂, ♀	43°20'E x 9°50'N	5000 ft.	20.-21.xii.33
2 ♂ ♂, ♀	43°10'E x 9°55'N	5500 ft.	8.1.-5.v.33
2 ♀ ♀	43°05'E x 9°55'N	4500 ft.	31.-1.2.ii.33
♂, 2 ♀ ♀	43°E x 10°N	1500 ft.	19.xii.33
♂	43°10'E x 10°10'N	5000 ft.	6.ii.33
3 ♂ ♂, ♀	42°50'E x 10°10'N	4500 ft.	6.13.-viii.33
2 ♂ ♂, ♀ (preg.)	42°40'E x 10°30'N	3500 ft.	20.-24.iii.33
♂, ♀	43°15'E x 11°15'N	1000 ft.	31.i.-5.ii.33

This series from the Ogo and the Guban, not far from the type-localities of *L. wachei* Werner, has keeled or tectiform dorsal scales arranged in from 36 to 48 rows across the body and from 8 to 11 femoral pores. The dorsum usually has 5 dark brown longitudinal lines of which the outermost are the broadest, and these and the median dorsal almost always extend onto the tail; the other two dorsals are frequently indistinct or broken up posteriorly. The flanks are black with three longitudinal rows of white ocellar spots, the uppermost series commencing behind the eye and the middle series below the eye on the lip. The lowermost, which is often indistinct, runs from axilla to groin. These lateral spots tend to form longitudinal lines but there is frequently a tendency for them to form vertical bars also. The pattern varies considerably in intensity and in three examples is so reduced that the dorsum is uniform grey and the flanks are only relieved by faint traces of white spots.

This series certainly represents the form to which the name *wachei* (from Hara and Diredawa) was given, but the range of morphological variation is sufficiently great to include both *boscai* (from Eritrea) and *burii* from near Berbera. The differences in the colour pattern between *boscai* and *wachei* do not seem to be sufficiently marked to warrant their retention as separate races, but in *burii* the ocellar lateral spots are completely fused to form two white longitudinal lines and the

outermost two dorsal dark lines are reduced to short streaks just behind the parietals. A short series of specimens from the north-east of British Somaliland resembles *burii* except that the degree of development of the outer dorsal stripes is variable and they may be quite as extensive as in typical *boscai*. Accordingly *burii* cannot be regarded as more than a race of *boscai* and the following have been examined:

2. LATASTIA BOSCAI BURII Boulenger

2 ♂ ♂	400 ft. near Berbera	Types.
♂, ♀	1300 ft. Beretableh, Nogal Valley	7.iv.30.
♂	1400 ft. Nogal Valley, 8°43'N x 48°43'E	6.iv.30.
♂	1000 ft. Al Mado Mts., 11°3'N x 40°47'E	20.xii.29.

Dorsal scales keeled or tectiform, in 40 to 45 series across the middle of the body; femoral pores 10-14.

The last four specimens are those referred by the author (1932, p. 355) to *L. boscai* as series A. In the same paper a number of other uniformly coloured specimens were referred to the same species as series B. Of these 8 were considered to be immature, but it seems probable that this was incorrect and that they represent a distinct, smaller species, *L. taylori*. The two originally considered adult (specs. n & o) appear to represent a southern race of *boscai* which may be known as:

3. LATASTIA BOSCAI ARENICOLA subspec. nov.

Latastia boscae Boulenger, 1912, Ann. Mus. Genova, (3), 5, p. 330; idem, 1921, Mon. Lacertidae, 2, p. 22 (part).

L. boscai Parker, 1932, Proc. Zool. Soc. London, p. 355 (part).

♂, ♀	Haud, 1900 ft., 7°55'N x 47°50'E	11.v.30.
♂	Haud, 2100 ft., 8°15'N x 46°20'E	4.3.-9.iv.32.
♂	Ado, 2100 ft., 7°20'N x 45°15'E	26.xi.34.
♀	Dolo, Italian Somaliland, Coll. Citerni.	

These specimens are the co-types. The race has the head shields and proportions of the typical form, but has somewhat smaller dorsal scales, which are in 45 to 48 series at the middle of the body and are tectiform or keeled; femoral pores vary from 10 to 12. The colour pattern is very different from that of normal individuals of either the typical subspecies, or of *burii*. The dorsum is reddish brown, with, at most, the merest traces of longitudinal stripes, which instead of being darker than the background are a very pale blue, and the flanks and sides of the head are marked with regular narrow vertical bars of

black and white; these markings vary in their intensity and may be almost completely absent or indicated by a dusky, dorso-lateral smudge. Specimens such as these can hardly be distinguished from occasional examples of the typical form such as have been mentioned above, but where the colour pattern is fully developed the two are markedly different.

The name indicates that this southern subspecies inhabits a zone of sandy country with thick scrub, whereas both the northern races are found in stony or rocky localities. This difference of habitat probably accounts for another morphological difference; in *arenicola* the claws are very long and acutely pointed, whereas in the other races from the rocky or stony areas the claws are only about half as long and are comparatively blunt. The colour differences are closely paralleled by the conditions found in *L. longicaudata*. In both species the race found in the Haud and Ogaden is distinctly reddish and dark dorsal markings are absent or replaced by light ones. The specimens taken in May were found in copula.

LATASTIA TAYLORI spec. nov.

(fig. 4)

Latastia boscai (part) Parker, 1932, Proc. Zool. Soc. London, p. 355 (specs. e-m).

Holotype a male, number 1931.7.20.337, in the British Museum, from the Buran Valley, 2500 ft. (10°20'N x 49°E); collected by Capt. R. H. R. Taylor, 17.x.1929.

Head flat, depressed, once and three quarters as long as broad, its depth a little less than the distance between the tip of the snout and the anterior corner of the eye, and its length contained 4.25 times in the length from snout to vent. Nostril pierced between four shields; upper nasals forming a suture half the length of the fronto-nasal which is a little broader than long and broader than the internarial space; prefrontals forming a median suture shorter than that between the nasals; frontal not grooved, a little longer than its distance from the rostral, once and two thirds as long as broad; interparietal not quite twice as long as broad, in contact with an occipital half its length; 4 supraoculars, the first divided into two, second and third large and subequal, fourth very small; a row of granules separating the supraoculars from the 5 supraciliaries. Lower eyelid scaly, translucent. Rostral not entering the nostril; two superposed post-nasals, the lower in contact with the first and second labials; anterior loreal half as long

as the second; five or six labials anterior to the subocular, which is much narrowed on the lip and separated by two scales from the posterior loreal; lateral edge of the parietal bordered by 3 elongate, narrow scales, of which the anterior is much the longest; anterior margin of the ear bordered by 3 or 4 scales of which the uppermost is the largest. Four pairs of chin-shields, the first 3 in contact and the last the largest; 31 gular scales between the chin-shields and the collar which has about nine scales on its edge, the median very large and the laterals grading into the granules of the neck. Dorsal scales oval, or subhexagonal, flat and smooth, in 39 series across the middle of the body and in 105 series between the occipital and the base of the tail (vertically over the vent); twenty-two in a transverse series between the hind limbs. Ventrals in six longitudinal series, with straight posterior borders, the two median series much narrower than the others; no group of small pectorals; twenty-five transverse series of ventrals; one very large preanal bordering the vent, preceded by another, but much smaller, shield. A series of enlarged plates beneath the fore-arm; upper tibial scales small, imbricate, keeled; ten or eleven femoral pores on each side; subdigital lamellae strongly bicarinate 26 beneath the fourth toe. Caudal scales in equal whorls, oblique and strongly keeled above, smooth beneath. Tip of the fourth toe reaching to midway between the arm and the ear.

Pale reddish brown above and on the tail, faintly marbled with grey anteriorly and on the head; flanks anteriorly and side of the neck with very irregular brown and greyish-white vertical marblings. Lower surfaces uniform white.

Length from snout to vent	43 mm.
Fore-limb	13 mm.
Hind-limb	26 mm.
Tail (regenerated in part)	87 mm.

The following specimens are paratypes of this species:

1931.7.20.339	♀	2000 ft.	10°15'N x 49°E	13.I.1930
1931.7.20.338	♀	20 ft.	11°14'N x 49°E	3.XII.1929
1931.7.20.340-342	3 ♂ ♂	2000 ft.	9°40'N x 49°E	
			[Ex. Field Mus.]	8.II.1930
1931 7.20. 335-336	♂, ♀	3100-3300 ft.	10°13'N x 48°46'E	8.I.1930

This series shows the following variations from the holotype: The head may be once and two thirds as long as broad, and its depth equal to the distance from the snout to the eye; supraciliaries 5 to 7; one or two scales between the posterior loreal and the subocular; 5 or 6

labials anterior to the subocular; dorsals in 36 to 41 series across the middle of the body; ventrals in 23 to 26 transverse series; gular scales 28 to 32; plates in the collar 5 to 7; femoral pores 9 to 12; subdigital lamellae beneath the fourth toes 24 to 27. The fourth toe extends to some point between the shoulder and the middle of the neck. The colour is usually olive, almost uniform, but with traces of lighter marblings anteriorly and on the sides of the neck and anterior part of the flanks, the latter having a tendency towards the formation of vertical bars. The subcaudal scales are smooth proximally, but keeled distally and an unregenerated tail is a little more than twice as long as the distance from snout to vent.

These specimens were originally believed to be all immature, but a female of 42 mm. from snout to vent is pregnant and the species appears to be consistently smaller than *boscai*. It is closely allied to the latter but may be distinguished by its broader, flatter dorsal scales, the absence of a frontal groove and different colour; it appears to be restricted to the north-eastern districts of Somaliland from the Sol Haud to the coast, an area close to that in which the strongly striped *L. boscai burii* also occurs (fig. 4).

Philochortus

- I. Usually no granules between the supraoculars and the frontal; dorsal and lateral scales in 28-46 rows at the middle of the body; 10-16 enlarged scales between the hind-limbs.
 - A. Parietals in contact, the interparietal small or absent, not reaching the occipital. Scales usually smooth. Colour pattern of six white lines, the median two bifurcating on the nape. . . *P. spinalis*
 - B. Parietals separated by the interparietal and occipital which are in contact. Scales keeled. Colour pattern of six white lines, the median two bifurcating on the nape. . . . *P. intermedius intermedius*
 - C. Parietals usually separated by the interparietal and occipital, rarely in contact; scales smooth or obtusely keeled. Colour pattern of five white lines, the median bifurcating on the nape.
 *P. phillipsi*
- II. Usually a more or less complete ring of granules between the supraoculars and the frontal; dorsal and lateral scales in 22-28 (?30) rows at the middle of the body; keeled; 6-8 enlarged scales between the hind-limbs. Colour pattern of five white lines, the median bifurcating on the nape *P. hardeggeri*

1. PHILOCHORTUS SPINALIS (Peters)

Lacerta spinalis Peters, 1874, Mon. Ak. Berlin, p. 369, pl. fig. 2.

Latastia spinalis Tornier, 1905, Zool. Jahrb., Syst., 23, p. 375.

2 ♂ ♂ Guban 42°40'E x 10°30'N, 3500 ft.

Previously this species has only once been recorded from British Somaliland (Tornier, loc. cit.) also from the Guban, close to Zeilah; otherwise it is Eritrean and Ethiopian in distribution¹ only.

2. PHILOCHORTUS INTERMEDIUS INTERMEDIUS Boulenger

Philochortus intermedius Boulenger, 1917, Proc. Zoöl. Soc. London, p. 152, pl. ii, figs. 2 & 3.

Latastia hardeggeri (non Steindachner) Boulenger, 1898, Ann. Mag. Nat. Hist., (7), 2, p. 130; Anderson, 1901, Proc. Zool. Soc. London, 2, p. 145 (part).

2 ♂ ♂ Borama District 43°10'E x 9°55'N, 4500-5500 ft.

3 ♂ ♂, 2 ♀ ♀ Borama District 43°E x 10°05'-10°10'N, 5000 ft.

This series agrees closely with the types of the species from the mountains inland from Berbera. The species is an inhabitant of stony mountainous territory in the north and appears to range along the coastal mountains as far as Berbera where it also enters the Guban; it may also enter the Eastern Haud (see below) and extends southwards to the lower Juba (Calabresi, 1927), but is replaced in the Lake Rudolf area by a closely allied subspecies.

PHILOCHORTUS INTERMEDIUS subsp.?

♂ Haud, 45°38'E x 8°28'N, 2500 ft.

This single specimen (Parker, 1932) is referred to the species *intermedius* on account of the number of keeled scales at mid-body, and between the hind-limbs, the absence of granules between frontal and supraoculars and the presence of an interparietal in contact with the occipital granule. But there is no colour pattern of white lines to clinch the specific status and there are notable differences from *intermedius*. It seems probable, however, in view of the large numbers of other lizards which are racially differentiated in the Haud, that this also is a local race of *intermedius*. It has a typical Haud colour of rufous brown, dotted with black and is remarkable among the species of *Philochortus* for its very strongly keeled scales.

¹Boulenger, 1909, Ann. Mus. Geneva, (3), 4, p. 310 records a "*Latastia spinalis* Peters" from Bardera, Ital. Somaliland. This record is not repeated or quoted elsewhere in the Monograph of the Lacertidae and is probably an error; *Philochortus intermedius* is the only species of the genus known from Italian Somaliland.

3. PHILOCHORTUS PHILLIPSI (Boulenger)

Latastia phillipsi Boulenger, 1898, Ann. Nag. Nat. Hist., (7), 2, p. 131.

Philochortus hardeggeri taylori Parker, 1932, Proc. Zool. Soc. London, p. 354.

? *Philochortus intermedius* Scortecci, 1931, Atti Soc. Ital. Sci. Nat., 70, p. 145.

Comparison of the large series of *Philochortus hardeggeri*, mentioned below, with the co-type series of *P. hardeggeri taylori* Parker, and the two cotypes of *P. phillipsi* Boulenger seems to indicate that the two latter cannot be distinguished. *P. phillipsi* occurs together with *hardeggeri* in the region of Berbera so that the two cannot be regarded as subspecies. In morphological characters *phillipsi* is scarcely distinguishable from *intermedius*, but it has the 5-lined pattern of *hardeggeri*; the specimen determined as *intermedius* by Scortecci (loc. cit. supra) came from El Donfar (49°04'E x 10°30'N) which is considerably beyond the known north-eastern limits of typical *intermedius*, but very close to the area from which *P. hardeggeri* was described and is probably therefore referable to *phillipsi*.

The species ranges from Berbera eastwards to Migiurtina and southwards into the Sol Haud, Nogal Valley and eastern Haud. In the first and last of these localities it overlaps the range of *intermedius* and the two may ultimately be found to intergrade.

4. PHILOCHORTUS HARDEGGERI (Steindachner)

Latastia hardeggeri Steindachner, 1891, Ann. Mus. Wien, 6, p. 371, pl. xi.

Eremias heterolepis Boettger, 1893, Zool. Anz., pp. 115, 193.

Latastia carinata (non Peters) Meek, 1897, Field Columb. Mus., Zool. (1), 8, p. 181.

Latastia degeni Boulenger, 1903, Ann. Mag. Nat. Hist. (7), 11, p. 55.

juv. ♀ Buraq, 3500 ft.

7 ♂ ♂ Haud, 2100-2700 ft., 45°29'-46°20'E x 8°30'-8°15'N

♀ Ogo, 3500 ft., 42°50'E x 10°20'N.

The last-mentioned female is almost topotypical for the species and agrees well with the adult co-type especially in having the series of granules between the supraoculars and the frontal incomplete. In the series from the Haud and Buraq, however, these granules always form a complete series and like many other lizards from that region, differ in a much lighter, rufous-brown colouration. If it should prove possible and desirable to recognise a distinct race the name *heterolepis*, type locality Lafarug, might be available; the type certainly has a complete circle of granules.

The species, which seems to frequent sandy country, ranges along

the coastal mountains from the Danakil depression to Berbera and into the western Haud. Tornier (1905) and Neumann (1905) also record it from the coastal plain near Zeilah.

GERRHOSAURIDAE¹

GERRHOSAURUS

- I. Ventral scales in 8 longitudinal series; dorsum between the dorso-lateral light lines, uniformly coloured *G. flavigularis*
 II. Ventral scales in 10 longitudinal series; dorsum dark brown or black with regular longitudinal series of yellow flecks
 *G. major bottegoi*

GERRHOSAURUS FLAVIGULARIS Wiegmann

Gerrhosaurus flavigularis Wiegmann, 1828, Isis, p. 379.

This species has not actually been recorded from British Somaliland. It is, however, a wide-spread species and has been recorded from Harar (Tornier, 1905; Neumann, 1905) so that its presence in the country and especially in the western mountains is to be expected. Loveridge (1937) classes it as a creature of the coastal plains and upland savannahs.

GERRHOSAURUS MAJOR BOTTEGOI del Prato

Gerrhosaurus bottegoi del Prato, 1895, Atti Soc. Ital. Sci. Nat., **35**, p. 19, fig.

G. major zechi Tornier, 1901, Arch. Naturg., **67**, p. 74.

3 Ads. Borama District 42°45'–43°E x 10°10'–10°20'N 5000 ft.

These specimens appear to be indistinguishable in morphological character from *G. major*, but have the coloration of *bottegoi*, of which *zechi* Tornier appears, as suggested by Schmidt (1919, p. 519) to be a synonym.² According to the material, admittedly rather scanty, in the British Museum, there are 3 recognisable races of *G. major*, as follows:

I. Uniform brownish above, or with only irregular dark markings; tail with alternating darker and lighter annuli. This form is confined to Kenya Colony, Zanzibar and northeastern Tanganyika Territory and is the typical form. *G. major major* Duméril.

¹Written prior to the revision of this family in Bull. Mus. Comp. Zool., **89**, pp. 483–543, which Mr. Parker, being engaged in war work, has not had the opportunity of seeing. A. L.

²Schmidt's (1919, p. 519) distinction between *bottegoi* and *grandis* of the yellow dorsal spots being between the scales in the former but on the scales in the latter, is not tenable. They are between the scales even in the type of *grandis*.

II. Black above, with longitudinal series of yellow spots between the dorsal scales; a more or less distinct yellow dorsolateral stripe; flanks brown with longitudinal light flecks forming regular series. Head black above with small yellow spots. This is a northern Sudanese subspecies, ranging from the Gold Coast to Eritrea and Somaliland. It enters the Savannas of the Congo around Garamba (Schmidt, 1919, loc. cit.), Uganda (Kyagwe and Kaiso) and probably north-eastern Kenya (? U.S.N.M. 42216 recorded by Loveridge, 1929, p. 66). In British Somaliland it appears to be confined to the mountains from the Borama district as far east as the Golis Range: *G. major bottegoi* del Prato.

III. Similar in colour posteriorly to the preceding, but anteriorly the light markings are more extensive, obliterating the darker colour and the whole of the upper surface of the head is pale brown, uniform or with small black or chocolate-brown spots. This race occurs in Zululand, Transvaal, Mozambique and Tanganyika Territory and should apparently be known as *G. major grandis* Boul.

It seems very probable that all records of *zechi* from the latter area (e.g. Cott, 1934, p. 165; Loveridge, 1933, p. 311) really refer to *grandis* whilst records of *zechi* and *major* from the northern area are based on specimens of *bottegoi*. The specimen from southern Italian Somaliland (Villagio Duca degli Abruzzi) recorded by Scortecci (1931, p. 146) may well, to judge from the description, be intermediate between the northern *bottegoi* and typical *major*.

CHAMAELEONTIDAE

Chamaeleon

- I. Casque strongly raised posteriorly, with a strong, median, parietal crest; no occipital dermal lobes *C. basiliscus*
- II. Casque scarcely raised posteriorly, almost flat above, with but a feeble parietal crest. Well developed, movable, occipital lobes present *C. dilepis ruspolii*

These are the only two true chamaeleons which have been recorded from British Somaliland. But a number of other species, such as *C. gracilis*, *C. senegalensis*, *C. affinis* and *C. bitaeniatus* are known from Ethiopia and Italian Somaliland and some of these may ultimately

prove to occur there. *C. affinis* has been recorded from the Harrar region (Tornier, 1905; Neumann, 1905) and may be expected in the mountains of the Ogo.

1. CHAMAELEON BASILISCUS Cope

Chamaeleon basiliscus Cope, 1868, Proc. Acad. Philad., p. 316.

♂, 3 ♀ ♀ along the boundary between 43°10'E x 9°55'N and 42°40'E x 10°35'N at altitudes of from 3000–5500 ft.

This is a species with an "Eremian" distribution which enters the protectorate in the coastal zone and mountains as far east as Dagh Shabell (S.S.E. of Berbera).

2. CHAMAELEON DILEPIS RUSPOLII Boettger

Chamaeleon ruspolii Boettger, 1893, Zool. Anz., p. 116.

3 ♂ ♂, 4 ♀ ♀, 5 juvs. from the Haud, between 45°43'E x 8°26'N and 44°44'E x 8°45'N, at altitudes of from 2350–3500 ft.

The status and distribution of the various races of *Chamaeleon dilepis* still present an unsolved problem. Loveridge (1936, p. 330) recognised only three races in eastern Africa, and finds considerable difficulty in accounting for the distribution of some of these; this difficulty may be, in part, due to the fact that some of his races are really composites. Certainly the series of chamaeleons listed above appears to represent a race distinct enough from the typical form to deserve subspecific recognition. As Boettger (1893, p. 116) pointed out in describing *ruspolii* from the Ogaden, the most characteristic feature is the very large size of the scales on the head and particularly on the occipital lobes. This character also appears in certain specimens found in the highlands of Nyasaland (*isabellinus* Günther) and this subsequently led Boettger to place his *ruspolii* as a synonym of the latter. But the two are apparently quite distinct, for the northern specimens differ from *isabellinus* and from any other examples of *dilepis* examined by the author, in their very feebly developed gular-ventral crest. This is composed of scales a little larger than those found elsewhere on the lower surfaces, but does not form the usual pendant crest and is quite indistinct posteriorly.

This race is apparently confined to the northern part of the Ogaden and Haud, and has not been recorded from the mountains or the coastal plain. Specimens collected to the south of the Haud, in the Jubaland-Tanaland area have small head scales and a prominent gular-ventral crest.

RHAMPHOLEON KERSTENI ROBECCHII Boulenger

Chamaeleo kerstenii Peters, 1868, Mem. Ak. Berlin, p. 449.

Rhampholeon robecchii. Boulenger, 1891, Ann. Mus. Genova, (2), 12, p. 13, pl. i, fig. 3.

Rhampholeon mandera Meek, 1897, Field Columbian Mus., Zool., 1, 8, p. 183.

2 ♂ ♂, 10 ♀ ♀ from various localities along the boundary in the Haud and Ogo between 46°20'E x 8°15'N and 43°E x 10°N at altitudes of from 2100 to 4500 ft.

Loveridge (1933, p. 329) has shown that bicuspid or simple claws and spinose or smooth scales on the soles of the feet can no longer be used to distinguish the genera *Brookesia* and *Rhampholeon*. But his suppression of the latter genus in consequence may, perhaps, be premature. Werner, in his account of these two genera in "Das Tierreich" mentions a number of osteological characters which also may be diagnostic but which Loveridge has not taken into account. Examination of the skeletons of the type species of *Brookesia* (*superciliaris*) and of *Rhampholeon* (*spectrum*) shows some profound osteological differences. (1) In *B. superciliaris* the nasal is large and unpaired and the vertebrae are modified in a unique manner. The zygapophyses, are carried on processes projecting laterally from the centrum, these processes being unconnected only on the first two cervicals. From the last (third) cervical backwards almost to the end of the tail (the last four excepted) a longitudinal arcade connects the two, enclosing a foramen between itself and the centrum; this arcade from the third dorsal backwards is apposed to the skin and its lateral face is heavily tuberculated. In addition dorsals 3 to 12 inclusive have a process ascending and curving backwards and inwards from the prezygapophysis, meeting and fusing with its fellow of the opposite side and connected by a median longitudinal bar with the tip of the neural spine, so that the whole centrum is enclosed within a basket-like framework (fig. 8). The first 7 of these peculiar dorsals (i.e. 3 to 9 inclusive) have a strong spine projecting laterally from the prezygapophysis and penetrating the skin, the spines becoming weaker caudad and in the most posterior sometimes being absent from one side or the other; a similar spine is developed on the sacrum which consists of two vertebrae more or less fused. On the caudal vertebrae the lateral arcade is broadened ventrally so as to come almost or quite into contact with the tip of the transverse process. (2) In *Rhampholeon spectrum* on the other hand the nasals are very small and paired whilst the vertebrae are of the normal saurian type without any of the excrescences of *Brookesia superciliaris*.

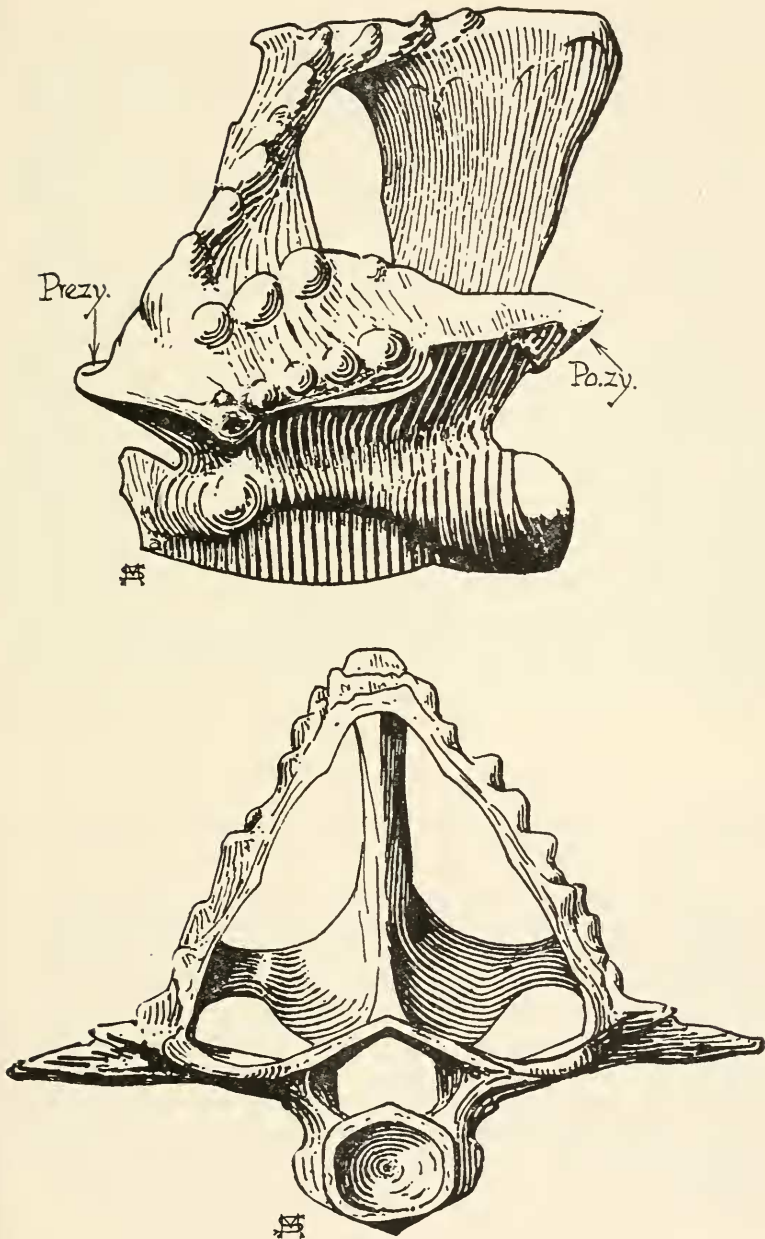


Fig. 8. Dorsal vertebrae of *Brookesia superciliaris*, seen from the side and front.

Prezy. = prezygapophysis; po.zy. = postzygapophysis.

Sufficient osteological material is not available to the author to determine whether the various species of *Brookesia* and *Rhampholeon* fall into two categories corresponding to the foregoing, but there seems to be a reasonable probability that they do. Thus all the continental species (*spectrum*, *temporalis*, *platyceps*, *kersteni*, *marshalli*, *brevicaudatus* and *boulengeri*) have the nasals small and paired, or absent, whilst there is no trace of the vertebral basket-like work. On the other hand the Malagasy species *superciliaris*, *stumpffi* and *ebenau* have large unpaired nasals and vertebrae similar to those described above; *B. dentata* which has vertebral spines projecting through the skin may be presumed to belong to this group also.

But the remaining Madagascar species (*nasus*, *minima*, *tuberculata* and *betsileana*) have no such spines and have, moreover, smooth scales on the soles of the feet, characters in which they agree rather with the type of *Rhampholeon*.

In British Somaliland this small, grass-frequenting chamaeleon appears to be confined to the districts south of the coastal mountains which it does not cross. To the south of the country it is wide-spread through the Ogaden and is replaced in Kenya Colony by the typical form; where the transition takes place has not been determined.

A peculiar and unexplained feature of this species is the preponderance of females over males in collections; this may indicate that the sexes have different habits or habitats.

SCINCIDAE

ABLEPHARUS WAHLBERGII (Smith)

Cryptoblepharus wahlbergii A. Smith, 1849, Ill. Zool. S. Afr., Rept., App. p. 10.

1 Ad. 42°50'E x 10°20'N 3500 ft.

Curiously enough this appears to be the first record of this common, wide-spread species from British Somaliland, though it has been reported from the Harrar region (Tornier, 1905; Neumann, 1905), from the southern districts of Italian Somaliland and from the latter country close to the eastern border of the British protectorate, near 49°04'E x 10°30'N (Scortecci, 1931). Loveridge (1937) classes it as a species found in the coastal plains and upland savannahs in Kenya, but since it has been reported up to altitudes of 2900 metres in Abyssinia (Tornier, 1905; Neumann, 1905) as well as from the barren, stony Darror Valley (El Donfar) it must obviously be an animal of very wide tolerances.

CHALCIDES OCELLATUS (Forskål)

Lacerta ocellata Forskål, 1775, Desc. Anim., p. 13.

Chalcides ocellatus var. *ragazzii* Boulenger, 1890, Ann. Mag. Nat. Hist., (6), 5, p. 444.

Lygosoma akeleyi Meek, 1897, Field Columbian Mus., Zool. Ser., 1, 8, p. 181.

Chalcides bottegi Boulenger, 1898, Ann. Mus. Genova, (2), 18, p. 719, pl. x, fig. 1.

30 specimens from various localities along the boundary northwards and westwards from 43°20'E x 9°50'N, to the sea and around Zeilah, at altitudes of from 0 to 5500 ft.

Scortecci (1928, p. 324) in discussing the variation of this species in Eritrea arrives at the conclusion that until sufficient material is available for a thorough and complete re-examination of the whole species it is impossible to recognise any distinct sub-species in the eastern part of its range. His remarks apply with equal force to the present series, for the species appears to have a vertical range of 7000 feet from sea level and the various "varieties" bear no apparent relation to distribution. A curious fact of its general distribution in Somaliland is its abundance in the coastal mountain and littoral zones and its apparent absence from the interior and especially from the Haud. This is probably to be correlated with the presence or absence of water for Flower (1933, p. 789) notes that in Egypt the lizard is widely distributed wherever there is water, though this need not necessarily be fresh or perennial.

Mabuya

- I. Subocular either excluded from the edge of the lip or so much narrowed that its lower margin is less than half the upper.
 - A. Two or three long, lanceolate scales on the anterior margin of the ear; first supraocular in contact with or narrowly separated from the frontal. A mid-dorsal and a pair of dorso-lateral light lines; three large dark spots in a longitudinal row behind the ear. Scales tricarinate in 30 to 34 series at the middle of the body *M. hildebrandtii*
 - B. Ear-lobules, if present, short; first supraocular well separated from the frontal; a pair of broad, dorso-lateral stripes but no median dorsal; a dark lateral band from the eye to the groin. Scales usually tricarinate, sometimes 5-7 carinate, in 32 to 40 series at the middle of the body *M. striata*

- II. Subocular bordering the lip, not narrowed appreciably inferiorly, so that its lower margin is always more than half as long as the upper.
- A. Scales on the soles smooth, but with one to three terminal spines; subdigital lamellae with a strong median keel and sometimes with traces of additional lateral keels; dorsal scales bicarinate, laterals tricarinate, in 30 to 34 rows at the middle of the body.
 *M. brevicollis*
- B. Scales on the soles without keels or terminal spines; subdigital lamellae smooth or obtusely keeled. Dorsal scales tri- or quinquercarinate.
- a. Scales in 25-32 rows at mid-body. A broad, light dorso-lateral stripe, but no mid-dorsal stripe. *M. planifrons*
- b. Scales in 32 to 46 rows at mid-body. Juveniles with 5 light stripes, one being median; in adults these stripes are lost and the whole dorsum is almost uniform.
 *M. quinqueaeniata*

In addition to the above species Mocquard (1888, p. 111) has recorded *Euprepes* (= *Mabuya*) *comorensis* from Somaliland, but this may be erroneous. Mocquard was reporting upon collections from Zanzibar and Somaliland and there is internal evidence in the paper that confusion of the localities did occur; for instance on p. 111 *Coronella olivacea* is recorded as from Somaliland, but on p. 28 it is definitely stated that the single specimen of this species collected came from Zanzibar.

1. MABUYA HILDEBRANDTII (Peters)

Euprepes hildebrandtii Peters, 1874, Mem. Ak. Berlin, p. 372, pl. fig. 4. — *Mabuya varia hildebrandtii* Scortecci, 1929, Atti Soc. Ital. Sci. Nat., 68, p. 257; Calabresi, 1927, Atti Soc. Ital. Sci. Nat., 66, p. 30.

The exact status of this form and its presence in British Somaliland are both uncertain. Loveridge (1923, Proc. Zool. Soc. London, p. 859 and 1929, p. 73) has expressed the opinion that *hildebrandtii* is a synonym of *varia*, but Scortecci (loc. cit supra) prefers to use the name subspecifically. The two are certainly very similar and Scortecci's view may be the correct one; all records of *hildebrandtii* are from between the route from Obbia to Berbera (Boulenger, 1891) and the Jubaland region,—Lugh (Boulenger, 1896c) Brava (idem, 1896b) and Goscia (Scortecci, 1929); *M. varia* has not been recorded within this area except by Calabresi (1927, p. 30) who was following Loveridge

in nomenclature, but whose specimens agreed with *hildebrandtii*. Boettger (1893), however, records both species from the Webi (Shebeli) Valley, and so, for the time being, it seems advisable to continue to recognise *hildebrandtii* as a distinct species. It may be regarded as a derivative of *M. varia* with particularly long auricular lobules, a modification which appears to have taken place independently in the superficially very similar *M. damarana* (Peters) of Angola and S. W. Africa. Boulenger's (1891) record indicates the possibility of its occurrence in eastern British Somaliland.

2. MABUYA STRIATA (Peters)

Tropidolepisma striatum Peters, 1844, Mem. Ak. Berlin, p. 36.

Mabuya varia (non Peters) Meek, 1897, Field Columbian Mus., Zoöl., 1, 8, p. 181.

14 specimens along the boundary in the Haud between 46°25'E and 43°10'E, at altitudes of 2100–4250 ft.

3 specimens from Burao, 3500 ft.

5 specimens from the Borama District, 4500–5000 ft.

This common, widely-distributed skink appears to be arboreal in most districts and this habit may explain its comparative rarity in the coastal plain from which it has only been recorded once and that on rather unreliable authority (Meek, loc. cit.).

3. MABUYA VARIA (Peters)

Euprepes varius Peters, 1867, Mem. Ak. Berlin, p. 20.

1 specimen from the Haud between 44°24'–44°44'E and 8°45'–8°52'N, 3500 ft.–3800 ft.

16 specimens from the Borama district between 42°50'–43°15'E and 9°50'–10°15'N, 4000–5400 ft.

In the north of its range this wide-spread species appears to be rather a montane form; it has not been recorded from the coastal plain; it is rare in the Haud and is replaced in the low-lying districts of the eastern Ogaden and Italian Somaliland by *M. hildebrandtii* (q.v.). This apparent preference does not hold, however, in territories further to the south for Loveridge (1937) records it as a species of the coastal zone, upland savannahs, the grassy uplands and alpine meadows.

The single specimen from the Haud is aberrant in the possession of only 28 scale-rows, a character only once previously recorded by

Loveridge (1936a, p. 317) in a specimen from Gongoni, Kenya Colony. Females collected in the Borama district in September were pregnant, but as Loveridge (loc. cit) records females in this condition in Kenya Colony in December, March and April, the breeding season appears to be extended.

4. MABUYA BREVICOLLIS (Wiegmann)

Euprepes brevicollis Wiegmann, 1837, Arch. Naturg., p. 133.

Mabuya somalica Calabresi, 1915, Mon. Zool. Ital., 26, p. 242.

10 specimens from the boundary in the Haud between 46°25' and 45°09'E, 2100-3050 ft.

1 juv. Ado, Ogaden, 45°15'E x 7°20'N, 2100 ft.

♂, ♀, juv. along the boundary between 42°50'E x 10°20'N and 42°45' E x 10°45'N, 2000-3500 ft.

Loveridge's suggestion that *somalica* is a northern race of *planifrons* appears highly improbable, for *somalica* with 32 scalerows, bi- or tricarinate dorsal scales, and a dorsal pattern of transverse dark zones beset with white spots is quite unlike *planifrons* which seldom has more than 30 scale rows, has tri- or quinque-carinate scales, and well-marked dorso-lateral light stripes as its salient characters. Instead *somalica* has so many features in common with *brevicollis* that it is impossible to avoid the conclusion that they are synonyms. The only morphological differences between the two, to judge from existing descriptions, appear to lie in the number of supraoculars in contact with the frontal and the condition of the subdigital lamellae. In the present series the first of these characters is found to be very variable; in six specimens the third supraocular touches the frontal, in four these two scales are separated and in one both conditions occur. The subdigital lamellae of *brevicollis* are described as smooth, those of *somalica* as uncarinate; actually they are uncarinate in *brevicollis* too, as pointed out by Boulenger (1896b, p. 19) although in older individuals they may become smooth through wear, so that this character also falls to the ground. There remains only colour, which is sufficiently variable in *brevicollis* to include the described condition of *somalica*. The white spots, so characteristic of the very young tend to persist in transverse bands, more particularly in males than in females, but are almost completely lost in the largest individuals (over 150 mm. from snout to vent) of both sexes.

The juvenile taken in July measures only 36 mm. from snout to vent and was, apparently, but newly hatched. The species was found

in dead trees and under piles of stones, and is widely distributed in all parts of the protectorate. It ranges from the coastal plain and upland savannahs of Kenya Colony and Tanganyika Territory (Loveridge, 1937) northwards to Eritrea and southeastern Arabia.

5. MABUYA PLANIFRONS (Peters)

Euprepes planifrons Peters, 1878, Mem. Ak. Berlin, p. 203, pl. ii, fig. 3.

1 Bohodle, in the Haud, 46°20'E x 8°15'N, 2100 ft.

2 Borama district, 5000 ft.

1 Ado, 45°15'E x 7°20'N, 2100 ft.

This species appears to be absent from the coastal plain but to be distributed throughout the rest of the protectorate from which it ranges southwards in the coastal plains and upland savannahs to Tanganyika Territory and westwards through the mountains of Abyssinia.

6. MABUYA QUINQUETAENIATA QUINQUETAENIATA (Lichtenstein)

Scincus quinquetaeniatus Lichtenstein, 1823, Verz. Double. Mus. Berlin, p. 103.

Mabuya semicollaris Werner, 1917, Mitt. Zool. Mus. Hamburg, 34, p. 33.

8 ♂ ♂, 4 ♀ ♀, 2 juvs. Borama Distr., 4000-5000 ft.

4 ♀ ♀ 42°40'E x 10°30'N, 3500 ft.

2 ♂ ♂ 43°E x 11'N, 1500 ft.

This species appears to be confined to the mountains as far east as Berbera, but has not been recorded from the Haud or any part of the area south of the mountains. These skinks from British Somaliland agree closely with the typical *quinquetaeniata* from Egypt in possessing 32-38 scales at mid-body, the pre-frontals almost always (88 percent) in contact to form a distinct suture and the throat of the male heavily mottled with black; this is in marked contrast to the immaculate-throated race of *obsti* of the countries south of Uganda and Kenya. As is often the case, the mountains seem to have been subject to invasion from the north and west and the present species provides further evidence of this. *M. quinquetaeniata* has almost a complete circum-rainforest distribution and extends northwards along the Nile Valley to Lower Egypt; but although it is common in northern Uganda, Kenya and Abyssinia, it appears to be completely absent from the Ogaden and Italian Somaliland. Unless the species formerly had a continuous distribution and has only recently become exterminated in this region, the population of the montane region in British Somaliland

must have been derived from the north-west and it is with examples from this area that the Somali population shows the closest affinity. Flower (1933, p. 758) concludes that the evidence of its distribution in Egypt "points to its being a tropical African form which has entered Egypt by the Nile and is still extending its distribution when opportunity offers".

Riopa

- I. Snout not depressed; fronto-nasal in contact with the rostral; nostril between the supra-nasal and two small nasals. Scales in 24-26 rows *R. producta* Boul.
- II. Snout depressed, wedge-shaped; rostral separated from the fronto-nasal.
 - A. Nostril between three shields. Two superposed preoculars.
 *R. sundevalii* Smith
 - B. Nostril between two shields (i.e. the anterior and supra-nasals fused). Two superposed preoculars.
 - 1. Four labials anterior to the subocular; frontal very narrow posteriorly; dorsal scales of juveniles tricarinate
 *R. laeviceps* Peters
 - 2. Three labials anterior to the subocular; frontal broader; dorsal scales smooth *R. modesta somalica*
 - C. Nostril in a single nasal; a single preocular. *R. vinciguerrae* Parker

RIOPA SUNDEVALII (Smith)

Eumeces (Riopa) sundevalii Smith, 1849, Ill. Zool. S. Africa, Rept., Appendix, p. 11.

Lygosoma ferrandii Boulenger, 1898, Ann. Mus. Genova, (2), 18, p. 718 pl. ix, fig. 2.

Ad. Haud, 4000 ft., 44°15'E x 8°55'N 28.ix.32.

Ad. Borama Distr., 5000 ft., 43°10'E x 9°55'N 9.v.33.

These two specimens have 24 scale-rows which appears to be the normal condition in British Somaliland and the surrounding territories (Parker, 1932, p. 359); but it seems doubtful whether the use of trinomials is justifiable to distinguish a subspecies in this area.

RIOPA LAEVICEPS (Peters)

(fig. 9)

Euprepes (Tiliqua) laeviceps Peters, 1874, Mem. Ak. Berlin, p. 371, pl. fig. 3.

9	specs.	Haud	2100 ft.	46°20'E x 8°15'N	10.ii.-30.iii.32.
2	"	"	2200 ft.	46°10'E x 8°15'N	8.iv.32.
1	"	"	3100 ft.	45°04'E x 8°39'N	14.vii.32.
1	"	"	2300 ft.	45°58'E x 8°21'N	11.viii.32.
2	"	"	2250 ft.	46°04'E x 8°19'N	12.viii.32.
3	"	"	2200 ft.	46°09'E x 8°17'N	12.viii.32.
2	"	Ado	2100 ft.	45°15'E x 7°20'N	23-26.xi.34.

These 20 specimens, compared with other specimens collected in the mountains of northern Somaliland, show conclusively that Boulenger (1896, p. 20) was wrong in uniting *laeviceps* and *modesta* and the author (1932, p. 360) was equally at fault in regarding the former as a northern

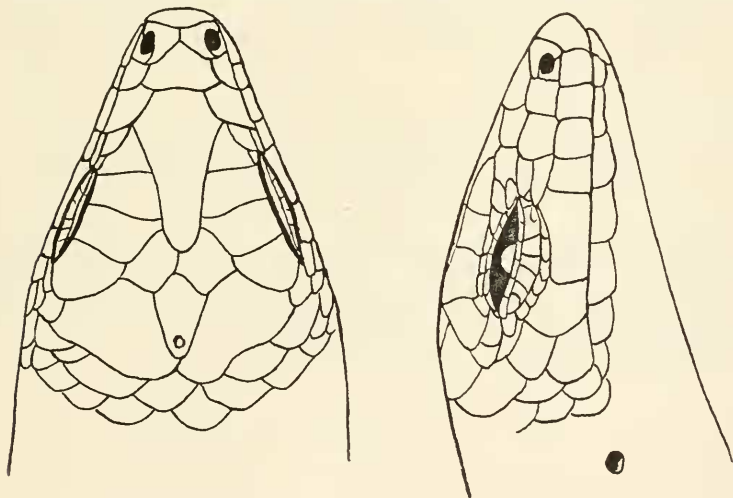


Fig. 9. Head scales of *Riopa laeviceps* Peters.
Adult measuring 80 mm. from snout to vent.

race of *modesta*; the above series, which agrees admirably with Peters's description of *laeviceps*, represents a distinct species which is recognizable by its longer, less depressed snout, larger fronto-nasal, much longer and narrower frontal, the presence of 4, instead of 3, labials anterior to the sub-ocular, and the tricarinate scales in the young. The head shields are very constant in all the specimens examined, and the differences in proportions are readily appreciable by a comparison of the accompanying figures (figs. 9 & 10).

The series shows little variation and the original description is adequate in most respects. There may, however, be 26 or 28 scales at the middle of the body, and the dorsals are tricarinate only in juveniles.

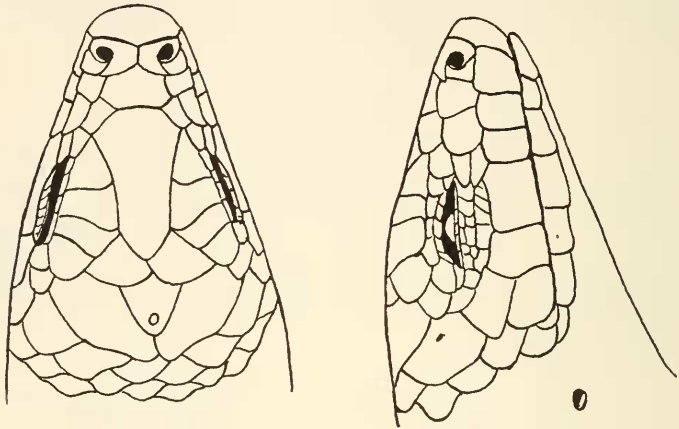


Fig. 10. Head scales of *Riopa modesta somalica* Parker. Cotype 1937.12.5.747, measuring 65 mm. from snout to vent, drawn to the same scale as Fig. 9.

The largest specimen measures 83 mm. from snout to vent and 3 females collected at the end of March have each two embryos in an advanced state of development. The species is cryptozoic, being found under logs and stones or in termites nests by day.

RIOPA MODESTA SOMALICA subsp. nov.

(Fig. 10)

Lygosoma modestum Boulenger, 1895, Proc. Zool. Soc. London, p. 535; idem, 1895, Ann. Mag. Nat. Hist., (6), 16, p. 168.

Lygosoma modestum laeviceps (non Peters) Parker, 1932, Proc. Zool. Soc. London, pp. 358, 360.

As pointed out above, the name *laeviceps* Peters is not available for the northern form of *modesta*, and a new one appears to be necessary; the name *sphenopiiforme* is, apparently, based on an aberrant specimen of typical, southern *modesta*. The northern race is represented in the British Museum and the Muséum d'Histoire Naturelle, Paris, by the following specimens which are the co-types of the name *somalica*:

1937.12.5.746.	Juv. 4500 ft. 42°50'E x 10°10'N	6.viii.33.	
			Capt. Taylor
1937.12.5.747.	Ad. 5500 ft. 43°E x 10°05'N	29.viii.32.	
			Capt. Taylor
95.6.14.25-26.	Ad. & juv. Inland of Berbera		Lort-Phillips
1905.10.30.97-98.	2 Ads. Near Berbera		Bury
1905.11.7.30-31.	Ad. & juv. Wagga (3-4000 ft.)		Golis Mts. Bury
Mus. Paris 1918.5.	Ad. Near Berbera		Bury

To judge from this material the subspecies is confined to the mountains and possibly also the littoral zone in British Somaliland, whereas the typical form occurs in central, eastern and northern Tanganyika Territory, eastern Kenya and southern Italian Somaliland.¹ Whether the two meet and intergrade in the intervening territory is uncertain but appears unlikely as this region is occupied by *Riopa laeviceps*. Since, however, the differences between the northern and southern forms, though clear, are slight they are ranked only as subspecies until further material is forthcoming.

Head shields as in *Riopa modesta* except that the frontal is constantly as long as or a little longer, instead of shorter, than the fronto-parietals and parietals together, and in 1937. (juvenile) the prefrontals and posterior loreals are fused; scales smooth, in 26 or 28 rows at mid-body; limbs slightly longer than in the typical form, the posterior contained 3.4 to 4.6 times in the length from snout to vent; outer toe much longer, with 7-9 (vice 5-6) subdigital lamellae, extending as far, or nearly as far, as the second. Largest adult 85 mm. from snout to vent. Juveniles pale brown, spotted with darker brown above, the spots forming longitudinal series, and with a broad, white-spotted, dark, lateral band. With increasing age these markings become less defined and the adult is pale brown with dark spotting on the head and indefinite small lighter and darker spots dorsally. Lower surfaces uniform white.

RIOPA VINCIGUERRAE (Parker)

17 specs.	Haud 2100 ft. 46°20'E x 8°15'N	26.i.-31.iii.32.
3 specs.	Haud 2400 ft. 46°25'E x 8°30'N	17.ii.32.
1 spec.	Haud 2300 ft. 45°58'E x 8°21'N	10.viii.32.
2 specs.	Haud 2200 ft. 46°09'E x 8°17'N	13.viii.32.
1 spec.	Haud 2100 ft. 46°19'E x 8°14'N	17.viii.32.
1 spec.	Haud 2400 ft. 45°49'E x 8°24'N	26.viii.32.
1 spec.	Ado 2100 ft. 45°15'E x 7°20'N	23.xi.34.

¹Boulenger, 1895c records "*Lygosoma modestum*" from Sheik Hussein (40°50'E x 7°45'N), in Eastern Abyssinia adjacent to the Ogaden. Possibly it is in this region, to the west of the area occupied by *R. laeviceps*, that the two subspecies of *R. modesta* meet.

This large series shows no appreciable differences from the types, though there may be 22 to 24 scales around the middle of the body. A common abnormality is the fusion of the prefrontals and posterior loreals which occurs on both sides in 8 specimens and on one side only in 3, 15 being normal. The species appears to range over the whole of the Haud and Ogaden regions from $8^{\circ}30'N$ in the north, to Lugh in the south.

APPENDIX

By Capt. R. H. R. TAYLOR, O.B.E.

A. *Topographical Information*

The 'Horn of Africa' (of which British Somaliland is a part) may be divided into three distinct tracts of country:

- (1) The fringe of maritime plain between the mountains and the sea.
- (2) The maritime mountains running almost parallel to the coast and often intersected by inland plains.
- (3) The raised plateau to the south with subsidiary hills lining the water drainage.

British Somaliland is further divided by the Sòmals into the following areas, which have distinctive natural features.

(a) The maritime plain and maritime mountains, known as the Guban. The maritime plain stretches inland from Zeila to a depth of 60 miles but soon narrows to an average depth of 7 or 8 miles by Bulhar and Berbera. Thence to the Italian frontier it extends rarely more than 2 miles inland. Generally speaking the plain is sandy with a scanty vegetation of a stunted character. Evergreen bushes, however, are frequently seen growing on the banks of the dry river beds which intersect the plain on their way to the coast. A certain amount of grass is to be found in the Zeila plain away from the coast.

The maritime hills south and west of the Zeila plain are a confused mass of low table-topped plateaux of black trap rock, with tufts of grass and occasional bushes growing between the thickly strewn boulders. South of Bulhar the hills are of greater height and are broken up into a number of parallel limestone ridges. They are bare, stony and precipitous, and are cut by deep and narrow river gorges. These gorges are thickly tree'd with thorn. Within the ranges and between them and the northern edge of the interior plateau are undulating plains, intersected by broad sand-rivers running between alluvial banks and a jungle of thick thorn. Between the rivers are

occasional patches of grass but the ground is usually of a gravelly and stony nature supporting a few thorn trees.

East of Berbera the maritime ranges merge into one another, retaining however the same character. Some distance beyond, they combine with the northern crest of the interior plateau to form an irregular range, 145 miles long, of limestone hills, which limit the maritime plain to a breadth varying from 200 yards to 2 miles.

(b) The northern crest bounding the interior plateau runs from Beyu Anod in a south-south-easterly direction to Hargeisa, whence it strikes in a north-easterly direction under the names of the Asa and Golis ranges. It is then broken by the Huguf plain, and afterwards runs slightly north of east to the Italian frontier.

From Beyu Anod, 2000 feet, the crest rises rapidly and as far as the mountains west of Hargeisa the average height is about 5000 feet. On the northern slopes grow cedar, box, accacia and euphorbia.

Near Hargeisa the crest is lower and the northern slope which is of a terraced nature, affords good pasturage and is known as the Ogo Guban.

From the Ogo Guban of Hargeisa, the crest rises gradually through the Asa, 3000 to 4500 feet, to the Golis range, 6000 to 7000 feet. After a break in the crest by the Huguf plain, the Golis reappears as the Warsangli mountains which form a uniform ridge some 6000 to 7000 feet high, although near Erigavo they ascend to nearly 8000 feet to form the Surud Ad mountains. The Warsangli and Golis mountains have a steep northern face which in places is formed by a series of precipitous steps. Cedar and box are to be found on the higher slopes and the whole is thickly covered with vegetation.

(c) The southern slope of the northern crest bounding the interior plateau consists of a strip from 10 to 30 miles in width of grassy downs or thorn covered wilderness. The slopes are usually gentle. The central part of this strip running across British Somaliland is known as the Ogo.

(d) That portion of the Daror valley (in the north-east of the country) which lies in British Somaliland, is of an arid nature and the surface for a great part consists of anhydrite beds (gypsum).

(e) The Nogal valley is formed by the junction of two main affluents, the northernmost rising in the Golis range and the southernmost in the southern slopes of Bur Dab. The valleys of these affluents afford good pasturage and are studded with thorn bush scrub. As the valleys widen, the bush becomes more sparse although good pasturage is still afforded for some distance after the junction of the two affluents.

Near the Italian frontier, the valley is arid and the surface instead of being of a limestone formation is of anhydrite beds (gypsum).

(f) The Haud may be said to be that part of the interior plateau running south of east from the line Jijiga-Jifu Meider to a line joining the geographical co-ordinates $L 49^{\circ}E \times 8^{\circ}N$ and $L 45^{\circ}E \times 6^{\circ}N$, and bounded on its northern side by the Nogal valley and on its southern by the Jerer and Fafan rivers. The area is undulating and is waterless in the dry season with the exception of a few scattered wells. The ground falls evenly from NW to SE, from 5500 feet between Jijiga and Jifu Meider to 400 feet at Galadi. The surface is either a red clay or red sandy soil and occasional outcrops of limestone rock occur. The red colour of the soil is a distinct feature of the area and it is particularly noticeable in the central portion. The type and density of the vegetation varies considerably throughout the area, from impenetrable thorn jungle, to sparse thorn scrub with an undergrowth of aloes, to open grass plains. The bush in the south-eastern half of the Haud is, on the whole, thicker than that in the north-western half where the grassy plains appear more often and are larger in size. Along the boundary with Italian East Africa where this passes through the Haud, it is noticeable that the dominant bushes and trees tend to be lower in height east of about $L 45^{\circ}E \times 8^{\circ}40'N$ than the dominants west of that point.

(g) The area between the Daror and Nogal valleys, known as the Sol Haud, is uniformly level and at about 3000 feet above sea level. Its vegetation is similar to that existing on the Haud.

B. Climatic Information

There are four main seasons in British Somaliland.

(1) The dry season (Jilal) which lasts from November to March. During this period there is practically no rain. The north-east monsoon blows during this period but is generally a mild wind. The nights are comparatively cold up country and the days, even on the coastal plains, not excessively hot. Several degrees of frost have been recorded on the frontier north-east of Jijiga.

(2) April is a hot and sultry month. The principal rainy season during the year occurs during May and June. These rains are known as the "Ju".

(3) The "Ju" rains are succeeded by the south-west monsoon, the wind being called locally the "Kharif". The "Kharif" generally blows from the beginning of June to the beginning of September. It is a strong wind and raises dust storms in any area where there is little

vegetation; it is particularly bad in the coastal area. The period when this wind blows is the hot season and is called by the Somals "Haga".

(4) October is a hot and sultry month like April, and the "Dair" rains fall about this time. These rains are very variable, sometimes there is a fairly good rainfall and at other times only one or two showers.

Rainfall: The rainfall in the country is very local and for that reason it generally happens that there is great variation in local conditions as to grazing, rainpools, etc. Also it does not behave in a strictly regular manner from year to year. Sometimes the rains start early and sometimes late. Some years they are heavier and in others very considerably less than the average. This will be noticed on an examination of the table of rainfalls at several stations over a period of years which is given below.

<i>Year</i>	<i>Berbera</i>	<i>Burao</i>	<i>Sheikh</i>	<i>Hargeisa</i>	<i>Zeila</i>	<i>Borama</i>	<i>Erigavo</i>
	ins.	ins.	ins.	ins.	ins.	ins.	ins.
1919	2.31	—	—	—	—	—	—
1920	2.29	—	—	—	—	—	—
1921	1.35	3.85	—	—	—	—	—
1922	0.79	—	16.64	15.28	—	—	—
1923	2.86	9.90	47.14	16.86	—	—	—
1924	0.98	8.96	23.51	18.06	0.56	—	—
1925	0.56	11.89	20.59	16.39	2.04	23.24	12.62
1926	6.54	12.30	27.38	31.91	10.81	27.79	18.34
1927	2.02	9.78	11.70	14.58	8.42	19.79	15.29
1928	1.09	9.07	19.90	12.45	3.08	15.99	10.50
1929	0.37	9.25	25.04	17.07	1.81	16.42	11.90
1930	4.63	6.50	27.02	20.67	8.83	22.55	12.84
1931	1.43	9.79	19.43	25.35	0.66	20.24	10.53
1932	2.20	5.58	18.79	15.28	8.12	25.99	11.07
1933	0.86	5.58	17.07	12.42	2.05	15.90	9.81
1934	1.70	5.67	18.17	15.19	5.46	18.37	12.53
1935	6.20	7.26	16.58	18.26	3.29	25.99	13.53
No. of years rainfall was recorded	17	14	14	14	12	11	11
Average annual rainfall for this period	2.25	8.24	22.07	17.84	4.59	21.12	12.63

Temperature

The record given below of maximum and minimum temperatures at certain stations, shows the conditions that prevail in the different zones in the country.

The figures shown are the mean of the observations of nine years (1925 to 1933 both inclusive). These observations vary little from year to year.

<i>Station</i>	<i>Mean Maximum degs. F.</i>	<i>Mean Minimum degs. F.</i>	<i>Absolute Maximum degs. F.</i>	<i>Absolute Minimum degs. F.</i>
Maritime region:				
Berbera	93	78	111	62
Northern edge of the interior plateau: Sheikh.	80	56	92	36
Interior plateau:				
Hargeisa	85	57	95	33
Borama	81	56	92	36
Burao	85	63	95	48

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